Return to M&A ✓
Screwworm

March 7, 1972

Subject: Request for Funds from Administrator's Contingency Fund for Screwworm Research

To: W. D. McClellan
Assistant to Deputy Administrator

This is in response to our recent conversation with Dr. H. R. Thomas on the above subject. As you are well aware, we are strengthening the ecological phase of our screwworm research at Mission, Texas, in order to help solve some of the emergency problems encountered by APHS in the southwestern eradication program. We plan to transfer one scientist before the end of the fiscal year to do this work. The majority of the ecological studies will have to be done in Mexico below the barrier zone. The present cooperative agreement with the Instituto Nacional de Investigaciones Agricolas with the Mexican Department of Agriculture is due to expire in June 1972. This cooperative work is located at the Cotaxla Experiment Station near Veracruz. There, for example, colonies of wild Mexican strains of screwworm are begun from flies caught in the field then later taken on to the Mission laboratory for study and inclusion into the current release program. We would like to amend this cooperative agreement so we can continue the research in Mexico for two more years with added emphasis on the ecological aspects of the work. The studies, of course, will be conducted cooperatively with our Mexican counterparts. This would require the sum of $25,000. The results obtained from studies conducted under this cooperative agreement will have a high impact on the Department's screwworm program. It has added significance if the program is moved further south into Mexico. Since it is an item that would not need additional funding next year and is in support of regulatory and control programs, we certainly hope that it will be given careful consideration for funding.

In addition, we still feel that our proposal for "Emergency Research Needed to Support Eradication of an Infestation of Citrus Blackfly in the Rio Grande Valley" should be given high priority consideration (see our February 15, 1972 and August 2, 1971 memorandums to Dr. Thomas regarding this subject, copies attached). APHS concurs in the need for techniques such as we propose. In fact, they are developing plans to lease a citrus grove for repeated collection of parasites, a procedure far less efficient than what we propose. I discussed OPRED ceilings with Leo Iverson, but contrary to rumors, APHS does not have any ceiling to give up. They are having trouble getting down to their ceiling.

H C Cox, Director
Entomology Research Division

CHSchmidt/mjb 3/3/72
HCCox added 2nd paragraph 3/7/72

To: Dr. Gartman from Dr. Bushland

From: Dr. Bushland ~~from~~ to Dr. L.Henderson or Dr. W.Klassen of ARS, Plant Science of Entomology in Beltsville, Maryland.

Screwworm

OCT 3 1972

Fall Eat

PROPOSAL FOR SCREWWORM RESEARCH UNDER CONTINGENCY FUNDS, FY 1973

1. Problem:

The ARS needs to expand screwworm research to assist APHIS in a critical eradication problem. The eradication program encountered severe problems in controlling screwworms in Texas in the summer and fall of 1971, and screwworm control failed in Texas and Oklahoma in 1972. The ARS Mission laboratory could not provide answers to questions as to whether wild flies had developed a form of genetic resistance to the sterile male technique or whether there was no change in the wild flies but rather a deterioration in the field competitiveness of sterilized flies. To obtain such answers requires greatly expanded field research in Texas and a renewal of intensified research in Mexico.

The only way in which critical field studies can be restored is through an expansion of the budget to return to the capabilities of the laboratory as it was originally organized in FY 1962 at an annual budget of $200,000.

2. Plan of Work:

Redirect emphasis from long term basic research and routine support studies to problem-oriented emergency research. This has already been started by the June 1972 transfer of a GS-11 laboratory entomologist, Joyce A. DeVaney, to College Station, Texas, and replacing her with a GS-13 field entomologist, Calvin Jones, transferred from Lincoln, Nebraska. In August, 1972, Dr. R. C. Bushland, GS-16 research entomologist, who did the original experiments on screwworm sterilization,

was returned to leadership of screwworm research by transfer back from Fargo, North Dakota. O. H. Graham, GS-15 research entomologist at Kerrville, has been detailed for up to 6 months' TDY at Mission to reemphasize field research in Mexico. D. E. Hopkins, GS-11 agricultural research technician, and Charles Dawkins, GS-9 biological aid, have been detailed from Kerrville for up to 6 months TDY at Mission. Their prime duty is to assist in emergency field experiments and to train 3 new temporary appointees in the technician skills needed for intensified field research.

3. Actions Taken or Anticipated:

The transfer of Dr. Bushland, the detailing of Dr. Graham, Mr. Hopkins, and Mr. Dawkins have already been done in anticipation of increased funding. Expanded field work is now underway and employment of 3 new temporary helpers (at WB-4 or 5 or GS-3 or 4 levels) is being requested. There will be a minimum requirement of $82,900 contingency funds in addition to the regular appropriation. Contingency funds will be spent as follows:

a. Personal Services		
(1) Three technicians	$16,000	
(2) Parttime laborers	2,500	
(3) Fringe benefits	1,400	
Sub-Total		$19,900
b. Travel--Domestic		
(1) Regular (includes per diem for TDY)		10,000
(2) Meetings		-0-
c. Travel--Foreign		
(1) Regular		10,000
(2) Meetings		-0-
d. Supplies		
(1) Chemicals, traps, field cages		8,000
(2) Animal feed		5,000
(3) Animal pens		2,000
(4) Gas, oil, vehicular maintenance		5,000
e. Equipment - 6 vehicles (trucks)		18,000
f. Construction & repairs		5,000
TOTAL		$82,900

4. Type of Work:

   a. Emergency research to discover the cause of current eradication problems.

   b. Develop new and more vigorous strains of screwworm flies to cope with the present situation.

   c. Conduct monitoring studies on the field performance of whatever kind of sterile fly that APHIS releases.

   d. Conduct ecological studies in southern and western Mexico in preparation for the joint US-Mexico program scheduled to be activated in FY 1974.

   e. Conduct genetic studies on flies from all over Mexico so that proper stocks will be available to APHIS for the expanded program.

5. Estimated Duration: 3-5 years.

6. Financing After 1973:

   Budget increase of 3 SMY's required to support a 40 million dollar expanded eradication program in Mexico.

Prepared by: Date: September 29, 1972

R. C. Bushland

E. A. Taylor

Copy to: A. W. Cooper, New Orleans

Waldemar Klassen, Beltsville

L. Henderson, Beltsville

4. Time of Work:

a. Emergency research to discover the cause of current prefabrication problems.

b. Develop new and more adequate strains of microwave films to supplant the present situation.

c. Conduct monitoring studies on the field performance of whatever kind of acceptable fly ash AERA develops.

d. Conduct ecological studies in northern and western Dakota in preparation for a full scale [illegible] program to be activated in FY 1974.

e. Conduct genetic studies on fish from all over Dakota so that proper stocks will be available to AERA for the expanded program.

3. Estimated Duration: 3-5 years.

4. Financing After 1973:

Budget increase of 3 MDT's required to support a $0 million dollar expanded irradiation program in Dakota.

Prepared by: Date: September 25, 1972

R. C. Beehler

R. A. Taylor

Copy for: A. W. Cooper, New Orleans

Valdemar Olsen, Bellevile

E. Bordeleau, Bellevile

280
20,000
560,000

Scarcum for Mexico

Pick up trucks
air conditioned — 4 @ 2800 — 8,400 — 10,000
operating — 30,000 mi. @ 8¢ — 2400 — 2500
Fly traps 120 (6 months life) 40 @ ~~5.00~~ 10.00 — ~~4800~~ — 4000
Twin bait — 4 lbs/wk 2,000 lbs @ 50¢ — 1000 — 1000
~~Sheep pens — 4 @ $100.00 — 400~~
~~Sheep pens 20 — upkeep 10 hrs 200 @ $15.00 — 3000~~

Micro weather stations (?) 35 @ ? — —

~~Sheep feed $2.00 per sheep/wk — 52 weeks @ $40 — 2800~~
~~Antibiotics for sheep — 20 x 52 wks 1000 doses @ $1.00 — 2000~~

Mexican technicians 6 @ 2,000 p.a. — 12,000 — 1500
American supervisor per diem 300 days @ $20 — 6,000

Cooperative agreement — (percent obligation) 16,000

48,400
32,400

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
NATIONAL PROGRAM STAFF
Plant and Entomological Sciences
Beltsville, Maryland 20705

FEB 12 1973
File
Ent

February 5, 1973

Subject: Budget Briefing Material

To: R. C. Bushland, Research Leader
Screwworm Research Laboratory
P. O. Box 986
Mission, Texas 78572

Thank you very much for the material you sent me. Enclosed are copies of the drafts I prepared to submit through channels to the Administrator. They may be of some value for future reference. I do not know whether there may be any changes before they get into final form.

You will see that I used what you sent me, added a little here and there, but modified the arrangement and shifted the emphasis. The objective of the briefing materials is to provide the Administrator with information that will enable him to field questions that may be thrown at him during the budget hearings. What those questions may be is a matter of judgment and guesswork to a large extent. It was my hunch that anything that might come up on the screwworm would be keyed to the failure of the control program in 1972. For that reason I assumed the responsibility for modifying the writeups to highlight that point. The information you provided about the research program is still there but just in a little different context.

It was necessary to delete your request for an additional 3 SMY's from where you had it because that item was not in the 1974 budget. I put it in at another spot.

I was somewhat surprised that the screwworm was not among the topics included for last year's briefing materials. There was no doubt in my mind that it should be added this year.

L. S. Henderson

L. S. Henderson
Staff Scientist
Insects Affecting Man, Animals,
Stored Products, and Households

Enclosure

cc:
A. W. Cooper, RD)
E. A. Taylor, AD) w/copy of encl.
H. O. Graumann, NPS

Division _____

Date February 1, 1973

Page _____

QUICK REFERENCE DATA

1. SUBJECT: Screwworm

2. PROBLEM: The APHIS screwworm eradication program in the Southwest was not effective in 1972 after having been a complete success for several years.

3. CURRENT BASE - FY 1973: 5.0 SMY
$241,300 plus a contingency allotment of
$75,000 for FY 1973

4. LOCATION: Mission, Texas

5. INCREASE REQUESTED: None in FY 1974 Budget

6. LOCATION FOR INCREASE:

7. OBJECTIVE OF RESEARCH: To generate the technical information required to enable APHIS to carry out an effective screwworm eradication program in the U.S. and Mexico.

8. DESCRIPTION OF WORK:

Underway

a. Field evaluation of the effectiveness of the current eradication effort.

b. Development of more vigorous strains of flies for sterilization and release.

c. Study the ecology of screwworms in northern Mexico.

New Work: Extend the research to apply to conditions in all of Mexico so that adequate technical knowledge will be available to support the joint U.S.-Mexico eradication program scheduled to start in 1974.

9. WHAT RECENT ISSUE RAISED: BY WHOM?: The failure of the eradication program in 1972 was a matter of concern and alarm to the entire livestock industry, especially in the southwestern States. The issue has been brought to APHIS and ARS by individual ranchers, livestock grower organizations, State livestock officials, and U.S. Senators and Representatives from the southwestern States.

10. CROSS REFERENCE TO OTHER PAGES OR SUBJECTS:

Division

Date February 1, 1973

Page

INFORMATION SHEET

1. SUBJECT: Screwworm

2. CAUSE OF THE PROBLEM: The screwworm fly, Cochliomyia nominovorax (Coquerel)

3. WHEN PROBLEM BECAME ECONOMIC OR A THREAT: The screwworm became a renewed threat with the failure of the eradication program in 1972.

4. NATURE OF PROBLEM: The screwworm has caused economic loss since the beginning of the livestock industry in the South. The sterile male release technique for control was developed by ARS research and applied successfully to eradicate the screwworm from the Southeast. Then it was applied in the Southwest to maintain a barrier zone where flies invading the U.S. from Mexico during the spring and summer would be overwhelmed. From 1964 through 1971 this successfully prevented the establishment of populations that had previously increased and extended their range northward each season. The savings to the livestock industry during this period are estimated to have been at least $120 million each year.

   In 1972 the control program failed to stop the flies as they invaded the U.S. from Mexico. They established populations in the barrier zone and spread on beyond it until cold weather stopped their activity. In the meantime losses were estimated to be about $40 million to the livestock industry in Texas and Oklahoma. Animals were infected as far north as Kansas and as far east as Florida, as well as westward into California.

5. WHAT NEEDS TO BE DONE: Intensify the research, find the reasons for the recent failure of the control program, and develop ways to prevent a recurrence. This is particularly important as the program moves into Mexico in 1973 and preparations are being made to initiate a joint U.S.-Mexico eradication program throughout Mexico in 1974. New geographic and environmental conditions will be encountered, as well as possible different strains of flies. There must be intensive field studies to evaluate the performance of the eradication program. All possible measures should be taken to improve the effectiveness of the sterile male technique so new challenges can be met.

   There is no item in the budget for an increase in funds but the research management has requested an additional 3 SMY's to attack the problem.

6. WHO IS DOING WORK ON PROBLEM: The only research is a cooperative effort between ARS and the Methods Development Section of APHIS.

7. HOW IS ARS WORK DIFFERENT OR COMPLEMENTARY: The ARS Screwworm Research Laboratory scientists are investigating screwworm genetics, ecology, radiation biology, and attractants. The ARS and APHIS teams are cooperating closely on details of mass rearing and release of flies, and on ecological studies in northern Mexico.

8. REFERENCE TO PREVIOUS SENATE AND HOUSE HEARINGS:

JAN 24 1973

Screwworm Research Laboratory
P. O. Box 986
Mission, Texas 78572

January 24, 1973

Subject: Information Sheet and Quick Reference Data

To: Lyman S. Henderson
Man, Animal and Stored Product Insects
Agricultural Research Center, West
Beltsville, Maryland 20705

This morning your secretary, Mrs. Orenstein, telephone me to relay your request that I immediately prepare two items relating to our screwworm research. A few hours later, she called back and I gave her the information from a tentative draft.

I did not have time to check this draft with Mr. Taylor before her second call, but I phoned the two items to him this afternoon. He approved the "Information Sheet" as I had given it to Mrs. Orenstein, but he suggested minor changes in the first draft of the "Quick Reference Data."

Information copies of those two items as approved by Mr. Taylor are enclosed.

R. C. Bushland
Research Leader

Enclosures

cc: E. A. Taylor

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R. C. Bushland
Research Leader

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cc: E. A. Taylor

INFORMATION SHEET

1. Subject: Screwworm Research.

2. Cause of the Problem: The Screwworm Fly, *Cochliomyia hominivorax* (Coquerel).

3. When Problem Became Economic and a Threat: Ever since there was a livestock industry in the southwestern US. USDA has had a continuing research program since 1913.

4. Nature of Problem: The sterile male technique as successfully applied in the Southern US eliminated losses after 1964. A few flies continued to invade the US from Mexico, but they were overwhelmed by the barrier of sterile male flies as maintained by APHIS. In 1972, Mexican flies penetrated the barrier and bred continuously in the US until cold weather stopped fly activity. Losses were particularly heavy in Texas, but some cases occurred as far north as Kansas and as far east as Florida.

5. What Needs to Be Done: Intensified research to find all the causes of the recent failure and prevent a recurrence.

6. Who is Doing Work on the Problem: Only the USDA in a cooperative effort between ARS and Methods Development Section of APHIS.

7. How Is ARS Work Different or Complementary: The ARS and APHIS teams are cooperating fully with APHIS giving attention to mass production and release efforts and ARS concentrating on screwworm genetics, ecology, radiation biology, and laboratory and field comparisons of sterilized flies. Some experiments, such as current studies in Northeastern Mexico, are jointly investigated by ARS and APHIS scientists working as one team.

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1. Subject: Screwworm Research.

2. Problem: Research support of APHIS Southwestern Screwworm Eradication and develop new knowledge for joint US-Mexico eradication effort which will start in 1974.

3. Current Base: $241,300 (A supplemental contingency allotment of $75,000 is expected.)

   SMY: 5

4. Location: Mission, Texas.

5. Increase Requested: 3 SMY.

6. Location for Increase: Mission, Texas.

7. Objective: To improve the effectiveness of the sterile male technique.

8. Description of Work:

   a. Underway:

      (1) Field evaluate effectiveness of the current eradication effort.

      (2) Develop more vigorous strains of flies for sterilization and release

      (3) Study ecology of screwworms in Northern Mexico.

   b. New Work: Extend research effort to apply to all of Mexico so that knowledge will be available to support joint US-Mexico eradication program.

9. What Recent Issue Raised: Screwworm eradication had been a complete success in the US from 1964 to 1971, saving the livestock industry at least 120 million dollars annually. In 1972, efforts to control flies coming in from Mexico failed in the Midwest at a cost of 40 million dollars to the livestock industry in Texas and Oklahoma.

   By Whom? The entire livestock industry of the Southwestern United States, particularly grower organizations, state livestock officials, and US Representatives and Senators from Southwestern States.

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1. Subject: Screwworm Research.

2. Problem: Research Support of APHIS Southwestern Screwworm Eradication and develop new knowledge for joint US-Mexico eradication effort which will start in 1974.

3. Current Base: $2,41,300 (A supplemental contingency allotment of $275,000 is expected.)

   SMY: 5

4. Location: Mission, Texas.

5. Increase Requested: 3 SMY.

6. Location for Increase: Mission, Texas.

7. Objective: To improve the effectiveness of the sterile male technique.

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10. Cross Reference:

U.S. DEPARTMENT OF AGRICULTURE

REFERENCE SLIP

DATE July 16, 19

TO Dr. Buckland

- [ ] ACTION
- [ ] NOTE AND RETURN
- [ ] APPROVAL
- [ ] PER PHONE CALL
- [ ] AS REQUESTED
- [ ] RECOMMENDATION
- [ ] FOR COMMENT
- [ ] REPLY FOR SIGNATURE OF
- [x] FOR INFORMATION
- [ ] RETURNED
- [ ] INITIALS
- [ ] SEE ME
- [ ] NOTE AND FILE
- [ ] YOUR SIGNATURE

REMARKS This is the proposed budget worked up by Mr. Taylor from your figures. This information went out this telecopier today, as indicated on your copy attached.

FROM Juanita Escamilla
Area Office

GPO : 1964 OF—742-059

FORM AD-514 (8-64)

Via Telecopier 7-16-73 to:
A. W. Cooper
L. Henderson
W. Klassen
E. F. Knipling
cc: R.C. Bushland

J.E.

FOR OFFICIAL USE ONLY
United States Department of Agriculture
Agricultural Research Service

Description of Event

Field data indicate sterile screwworm flies released in eradication program have low mating competitiveness and are essentially ineffective in eradicating screwworms or at least maintaining fly populations below economic levels.

Anticipated Timing

New application research programs should be implemented ASAP, not later than October, with detail research program review in August or September 1973.

Background

The APHIS screwworm eradication program in the Southwest was not effective in 1972. The program in Arizona is currently in a critical situation. The number of cases that have occurred through June in Arizona exceeds by far the number that occurred by this time in 1972.or in previous years since the program was fully implemented in 1963. Field data from Mexico during the spring of 1973 indicated that massive over-flooding of wild fly population with sterile flies failed to reduce fertility of egg masses below 50%. Preliminary isoenzyme analyses of APHIS mass production stock have indicated a great loss of genetic variability (heterozygosity). Genetic deterioration of laboratory and plant production stocks has affected the quality of released flies as measured by mating competitiveness under field conditions but not the quantity (current plant production exceeds 200 million flies per week).

Source of Interest

The failure of the eradication program in 1972-73 is a matter of concern and alarm to the entire livestock industry. This is of high interest to U. S. Senators and Representatives from the Southwestern States and the Joint U.S.-Mexico Screwworm Eradication Commission.

Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

FOR OFFICIAL USE ONLY
United States Department of Agriculture
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Anticipated Consequences

ARS assume the responsibility for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the Joint U.S.-Mexico Eradication Program and expend attractant field studies in the United States and Mexico. Expanded APHIS Eradication Program budget $16 - $19 million; ARS current program $252,000. (See proposed new budget.)

Contacts for Additional Information

E. F. Knipling	Beltsville, MD	PH. (301) 344-3245
W. Klassen	Beltsville, MD	PH. (301) 344-3918
L. S. Henderson	Beltsville, MD	PH. (301) 344-3924
R. C. Bushland	Mission, TX	PH. (512) 585-2783
E. A. Taylor	Weslaco, TX	PH. (512) 968-5913

Date Submitted July 16, 1973

Priority	Category	I	Definite
	Category	II	Immediate
	Category	III	ARS

Anticipated Consequences

ARS assume the responsibility for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the joint U.S.-Mexico Eradication program and expand attractant field studies in the United States and Mexico. Expanded APHIS Eradication Program budget $16 - $19 million; ARS current program $252,000. (See proposed new budget.)

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Date Submitted July 16, 1973

Priority Category I Definite
Category II Immediate
Category III ARS

PROPOSAL FOR EXPANDED ARS APPLICATION

SCREWWORM RESEARCH PROGRAM

ARS production of breeding stocks to be supplied daily to APHIS:

1. Have 3 genetically distinct breeding stocks each developed from 20 or more field collected egg masses.

2. To maintain genetic purity of strains each (designated A, B, and C) reared separately as shown on building sketch.

3. For breeding stocks to produce 200 million flies weekly, APHIS now eggs 3 million. We will give APHIS 1 million eggs per day--333,000 each of strains A, B, and C. APHIS will rear these eggs to adult and stock rearing cages with equal mixture of A, B, and C pupae--10,000 - 12,000 of each strain. At random mating eggs from these cages will be 1/9 pure A, 1/9 pure B, 1/9 pure C and 2/3 will be AB, AC or BC with hybrid vigor.

4. To produce ARS eggs we will start stocks each day for strain A (similarly for B and C):

15,000 pupae in standard colony cage
Egg when 8 days old;
7,000 females should survive, if only half oviposit;
3500 @ 200 eggs each lay 700,000 eggs. (Quota is 333,000)

If this margin of safety is inadequate we can increase cage stocks to as high as 35,000 flies.

5. Production facilities should easily be adequate to produce 2 million flies of each strain per week extra capacity for field tests.

6. A fourth rearing area equivalent to those for the 3 production strains will be used to develop new colonies and to test new procedures. There will be built up reserve strains to be field tested as candidate replacements for production strains. It is anticipated that each production strain will be replaced by a newer strain within 2 years to maintain breeding stocks as nearly wild-type as possible.

7. Isozyme studies will be used to monitor each generation of production stocks. Isozyme surveys will be indexes of genetic variability of field collections.

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SCREWWORM RESEARCH PROGRAM

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New Building and Equipment for Screwworm Breeding Colonies:

New 80 x 80 building for breeding stocks:
(Estimates by Joe Smithey for APHIS force construction)

Building shell	$ 50,000
Electrical, air-conditioning, plumbing	$ 25,000
Total	$ 75,000

Equipment:

Colony cages (APHIS specs.)	36 @ $530 ea.	$ 19,080
Rearing vats (APHIS spec.)	21 @ $130 ea.	$ 2,730
Vat racks (APHIS spec.)	7 @ $150 ea.	$ 1,050
Bacteriological incubators	4 @ $300 ea.	$ 1,200
Rearing vats (1/4 size)	12 @ $ 75 ea.	$ 900
Pupa holding trays	48 @ $ 10 ea.	$ 480
Larva capture pans	56 @ $10 ea.	$ 560
Media mixers	4 @ $300 ea.	$ 1,200
Refrigerators	4 @ $250 ea.	$ 1,000
Total		$ 28,200

Equipment for physiology research:

Bioclimatic cabinets	2 @ $1700 ea.	$ 3,400

Miscellaneous rearing equipment:

Small cages	100 @ $10 ea.	$ 1,000
Larva sifters	4 @ $75 ea.	$ 300
Larva-pupa separators	4 @ $100 ea.	$ 400
Total		$ 1,700

GRAND TOTAL $108,000

New Building and Equipment for Screwworm Breeding Colonies:

New 80 x 80 building for breeding stock:
(Estimates by Joe Smithey for APHIS force construction)

Building shell	$50,000
Electrical, air-conditioning, plumbing	$25,000
Total	$75,000

Equipment:

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GRAND TOTAL $108,000

New Positions for Expanded Application Research for Screwworm:

2	Entomologists GS-12 (Mexico, field)	$ 34,000
1	Entomologist GS-12 (Physiology)	$ 17,000
1	Entomologist GS-12 (Laboratory Rearing)	$ 17,000
1	Biochemist GS-12 (Isozyme studies)	$ 17,000
1	Technician GS-7 (Laboratory rearing)	$ 9,500
3	Technicians GS-5 (Laboratory rearing)	$ 23,400
3	Technicians GS-3 (Laboratory rearing)	$ 18,500
3	Technicians GS-1 (Fly sorting)	$ 15,000
1	Laborer WB-2 (Laboratory Janitor)	$ 5,000
1	Clerk GS-3 (Office)	$ 6,200
17	Total	$162,600
	Travel and Support	$113,400
	Total	$275,000
	Rearing building and equipment (APHIS contribution)	$108,300
	GRAND TOTAL	$383,300

APHIS should supply food for larvae and adults and utilities for new building.

Date Submitted: July 16, 1973

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Date Submitted: July 16, 1973

DRAFT:RCBushland:EATaylor:je 7/16/73 EAT

PROPOSAL FOR EXPANDED ARS APPLICATION SCREWWORM
RESEARCH PROGRAM

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Building and

New equipment for breeding colonies:

screwworm

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Pupa holding trays	48 @ $ 10 ea.	--------	$ 480
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Media mixers	4 @ $300 ea.	--------	$ 1,200
Refrigerators	4 @ $250 ea.	---------	$ 1,000
	Total	----------	$28,200

New equipment for physiology research:

Bioclimatic cabinets	2 @ $1700 ea.	-------	$ 3,400

Miscellaneous rearing equipment:

Small cages	100 @ $10 ea.	---------	$ 1,000
Larva sifters	4 @ $75 ea.	---------	$ 300
Larva-pupa separators	4 @ $100 ea.	---------	$ 400
	Total	--------	$ 1,700

GRAND TOTAL FOR EQUIPMENT ---------- $33,300

New 80 x 80 building for breeding stocks:
(Estimates by Joe Smithey for APHIS force construction)

Building shell ----------	$ 50,000
Electrical, air-conditioning, plumbing ----------	$ 25,000
Total ----------	$ 75,000

Grand total 108,000

New equipment for breeding colonies:

Colony cages (APHIS specs.)	36 @ $530 ea.	--------	$19,080
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Building shell ----------	$ 50,000
Electrical, air-conditioning, plumbing ----------	$ 25,000
Total -------	$ 75,000

New ~~salary expense~~ Positions for - Expanded application for Screwworm Research:

2	Entomologists GS-12 (Mexico, field)	$ 34,000
1	Entomologist GS-12 (Physiology)	$ 17,000
1	Entomologist GS-12 (Laboratory rearing)	$ 17,000
1	Biochemist GS-12 (Isozyme studies)	$ 17,000
1	Technician GS-7 (Laboratory rearing)	$ 9,500
3	Technicians GS-5 (Laboratory rearing)	$ 23,400
3	Technicians (GS-3) Laboratory rearing	$ 18,500
3	Technicians GS-1 (Fly sorting)	$ 15,000
1	Laborer WB-2 (Laboratory Janitor)	$ 5,000
1	Clerk GS-3 (Office)	$ 6,200
17	Total	$162,600
	Support Travel and	$ ~~74,400~~ 113,400
	Total	~~$237,000~~
	~~?~~	275,000
	~~Non-F~~ Rearing Building & Equipment APHIS Contribution	108,300
	GRAND TOTAL	~~$620,300~~ 383,300

APHIS should supply food for larvae & Adults and utilities for new building

New salary expense - Expanded Research.

2 Entomologists GS-12 (Mexico, field)	$ 34,000
1 Entomologist GS-12 (Physiology)	$ 17,000
1 Entomologist GS-12 (Laboratory)	$ 17,000
1 Biochemist GS-12 (Isozyme studies)	$ 17,000
1 Technician GS-7 (Laboratory rearing)	$ 9,500
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3 Technicians (GS-3) Laboratory rearing	$ 18,500
3 Technicians GS-1 (Fly sorting)	$ 15,000
1 Laborer WB-2 (Laboratory Janitor)	$ 5,000
1 Clerk GS-3 (Office)	$ 6,200
17 Total	$162,600
Support Travel	$ 74,400
Total	$237,000
	275,000
NOW-?	108,300
GRAND TOTAL	$620,300

Travel estimates - field research:

Present Staff:

Hightower:	100 days @ $22	$ 2,200
	Car expense @ $10/day	$ 1,000
Jones:	150 days @ $22	$ 3,300
	Car exp. @ $10/day	$ 1,500
Gonzales:	150 days @ $22	$ 3,300
	Car exp. @ $10/day	$ 1,500
Lopez:	150 days @ $22	$ 3,300
	Car exp. @ $10/day	$ 1,500
Bushland:	150 days @ $22	$ 1,100
	Car Exp. 25 days @ $10	$ 250
	Air travel, 4 trips-Washington, Gainesville, Los Alamos, etc	$ 1,000
	Total	$19,950

9600
29550

Travel estimates -

New Staff:

GS-12 Entomologist - Southern Mexico		
	150 days @ $22	$ 3,300
	Car exp. 150 days @ $10	$ 1,500
GS-12 Entomologist - Northern Mexico		
	150 days @ $22	$ 3,300
	Car exp. 150 @ $10	$ 1,500
	Total	$ 9,600

Southern Mexico entomologist to work with INIA studying screwworm ecology, doing field tests of new strains and collecting egg masses for genetic studies and possible laboratory colonization.

Northern Mexico entomologist to do similar work in cooperation with Monterrey Tech.

Travel estimates - field research:

Present Staff:

Hightower: 100 days @ $22 ----------$ 2,200
Car expense @ $10/day----------$ 1,000

Jones: 150 days @ $22 ----------$ 3,300
Car exp. @ $10/day ----------$ 1,500

Gonzales: 150 days @ $22 ----------$ 3,300
Car exp. @ $10/day ----------$ 1,500

Lopez: 150 days @ $22 ----------$ 3,300
Car exp. @ $10/day ----------$ 1,500

Buenland: 150 days @ $22 ----------$ 1,100
Car Exp. 25 days @ $10 --------$ 250
Air travel, 4 trips-Washington,
Gainesville, Los Alamos, etc$ 1,000

Total ---------- $19,950

Travel estimates -

New Staff:

GS-12 Entomologist - Southern Mexico
150 days @ $22 ----------$ 3,300
Car exp. 150 days @ $10 ----------$ 1,500

GS-12 Entomologist - Northern Mexico
150 days @ $22 ----------$ 3,300
Car exp. 150 @ $10 ----------$ 1,500

Total ---------- $ 9,600

Southern Mexico entomologist to work with INIA studying screwworm ecology, doing field tests of new strains and collecting egg masses for genetic studies and possible laboratory colonization.

Northern Mexico entomologist to do similar work in cooperation with Monterrey Tech.

Additional Budget Needs - Mission:

ARS Production of Breeding Stocks:

New Building	$ 75,000
New Equipment	$ 33,300
Salaries, New Production Staff	$128,600
Total - Production of breeding stocks	$ 236,900

Expanded Mexico Field Studies:

Salary- 2 GS-12 Entomologist	$34,000
Travel costs, 2 new men	9,600
Travel costs, present staff	20,000
Total - Mexico field studies	$63,600

TOTAL BUDGET INCREASE ----------$ 300,500

The budget does not reflect the costs of food for larvae and adults or the cost of utilities required for rearing flies.

Additional Budget Needs - Mission:

ARS production of breeding stocks:

New Building ----------$ 75,000

New Equipment ----------$ 33,300

Salaries, New Production
Staff ----------$128,600

Total - production of breeding stocks$ 236,900

Expanded Mexico Field Studies:

Salary- 2 GS-12 Entomologist - $34,000

Travel costs, 2 new men ------ 9,600

Travel costs, present staff--- 20,000

Total - Mexico field studies ------- $63,600

TOTAL BUDGET INCREASE ----------$ 300,500

The budget does not reflect the costs of food for larvae and adults or the cost of utilities required for rearing flies.

First draft of
a proposal to E. A. Taylor

by R. C. Bushland
Jul 1, 1953

Proposal for Expanded ARS Application Research Program

~~Program for~~ ARS production of breeding stocks to be supplied daily to APHIS

1. Have 3 genetically distinct breeding stocks each developed from 20 or more field collected egg masses.
2. To maintain genetic purity of strains each (designated A, B and C) reared separately as shown on building sketch.
3. For breeding stocks to produce 200 million flies weekly APHIS now eggs 3 million. We will give APHIS 1 million eggs per day — 333,000 each of strains, A, B & C. APHIS will rear these eggs to adult and stock rearing cages with equal mixture of A, B & C pupae 10,000-12,000 of each strain. At random mating eggs from these cages will be 1/9 pure A, 1/9 pure B, 1/9 pure C and 2/3 will be AB, AC or BC with hybrid vigor
4. To produce ARS eggs we will start stocks each day for strain A (similarly for B & C):
   15,000 pupae in standard colony cage
   Egg when 8 days old,
   7,000 ♀'s should surive, if only half oviposit,
   3500 @ 200 eggs each lay 700,000 eggs. — (Quota is 333,000)
   If this margin of safety is inadequate we can increase cage stocks to as high as 35,000 flies,

Fly Breeding program, continued -

5. Production facilities should easily be adequate to produce 2 million flies of each strain per week extra capacity for field tests

6. A fourth rearing area equivalent to those for the 3 production strains will be used to develop new colonies and to test new procedures. There will be built up reserve strains to be field tested as candidate replacements for production strains. IT is anticipated that each production strain will be replaced by a newer strain within 2 years to maintainbreeding stocks as nearly wild-type as possible.

7. Isozyme studies will be used to monitor each generation of production stocks. Isozyme surveys will be indexes of genetic variability of field collections.

page 3

80' x 85'

July 12, 1973
R. C. Bushland
A. J. Graham

80' x 88' Rearing Building Specifications

Foundation - reinforced concrete slab
Exterior walls - plywood on 16" center 2x4 studs
insulated with spray-on polyurethane
Roof - plywood insulated with polyurethane
Interior walls - Painted (waterproof) plywood,
except as follows:
Chill rooms - Double, Insulated plywood
Cage wash - Concrete block
Larva rearing - Concrete block on 2' concrete base
poured continuous with floor.
Floor - Smooth finish poured concrete

Air Conditioning - (1) Independent for 4 adult
colony rooms programed for 90°F. at noon, 70°F. at midnight.
(2) - Constant temp. 80°F. ± 2° in rest
of building - relative humidity 50% ± 10%
(3) pupation rooms - Humidifiers added
for 90% R.H. - air exhausted, no return
(4) Larva rearing rooms - air exhausted, no return

Lighting - Day-length programmed with dimmer
switches for adult colony and larva rearing.
Red lights for night periods.

New equipment for breeding colonies

Colony cages (APHIS specs.)	36 @ $530 ea. -	19,080
Rearing vats (APHIS spec.)	21 @ $130 ea -	2,730
Vat racks (APHIS spec.)	7 @ 150 ea -	1,050
Bacteriological incubators	4 @ 300 ea	1,200
Rearing vats (1/4 size)	12 @ 75 ea	900
Pupa holding trays	48 @ 10 ea	480
Larva capture pans	56 @ 10 ea.	560
Media mixers	4 @ 300 ea.	1200
Refrigerators	4 @ 250 ea.	1000
	Total	28,200

New equipment for physiology research

Bioclimatic cabinets	2 @ 1700 ea.	3400
	Total	3400

Miscellaneous rearing equipment

Small cages	100 @ $10 ea.	1,000
Larva sifters	4 @ 75 ea	300
Larva-pupa separators	4 @ 100 ea	400
		1,700

Grand total equipment 33,300

New 80 x 88 Building for Breeding Stocks

(Estimates by Joe Smithey for APHIS force construction)

Building shell -	50,000
Electrical, air-conditioning, plumbing	25,000
Total	75,000

New salary expense - Expanded research

2 - Entomologists	GS-12	(Mexico, field)	34,000
1 - Entomologists	GS-12	Physiology	17,000
1 - Entomologist	GS-12	(Laboratory)	17,000
1 - Biochemist	GS-12	(Isozyme studies)	17,000
1 - Technician	GS-7	(Laboratory rearing)	9,500
3 - Technicians	GS-5	(" ")	23,400
3 - Technicians	GS-3	(" ")	18,500
3 - Technicians	GS-1	(Fly sorting)	15,000
1 - Laborer	WB-2	(Laboratory janitor)	5,000
1 - Clerk	GS-3	(Office)	6,200

~~162,600~~
~~145,600~~
74400

17 Total.

Support travel 231,000
~~220,000~~
275,000

non recurring 108,300
~~583,300~~
620,300

Travel estimates - field research

Present staff

Hightower		
	100 days @ $22	2200
	Car expense @ $10 per day	1000
Jones		
	150 days @ $22	3300
	Car expense @ $10 per day	1500
Gonzales		
	150 days @ $22	3300
	Car expense @ $10 per day	1500
Lopez		
	150 days @ $22	3300
	Car expense @ $10 per day	1500
Bushland		
	50 days @ 22	1100
	Car expense 25 days @ 10	250
	Air travel 4 trips Washington, Beaneville, Tuskaloosa, etc	1000
	Total	19,950

Travel estimates - field research (Cont.)

New staff

GS-12 entomologist - Southern Mexico

150 days @ $22	3300
car 150 days @ $10	1500

GS-12 entomologist - Northern Mexico

150 days @ $22	3300
car expense 150 @ $10	1500

Southern Mexico entomologist to work with INIA studying screwworm ecology, doing field tests of new strains and collecting egg masses for genetic studies and possible laboratory colonization

Northern Mexico entomologist to do similar work in cooperation with Monterrey Tech.

Total Field Travel New Staff 9,600

Additional Budget Needs Mission

ARS Production of Breeding Stocks –

New Building	– 75,000	108,300	
New Equipment	– 33,300		
Salaries New Production Staff	– 111,600	128,600	
Total, production of breeding stocks	219,900		236,900
Expanded Mexico Field Studies			
Salary 2 GS 12 Entomologists	– 34,000		
Travel Costs 2 new men	9,600		
Travel Costs present staff	20,000		
Total – Mexico Field studies	63,600		63,600
Total Budget Increase	282,500		300,500

The budget does not reflect the costs of food for larvae & adults or the cost of utilities required for rearing flies.

ROUGH DRAFT 7/3/73

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United States Department of Agriculture
Agricultural Research Service

Description of Event

Field data indicate sterile screwworm flies released in eradication program have low mating competitiveness and are essentially ineffective in eradicating screwworms or at least maintaining fly populations below economic levels.

Anticipated Timing

New application research programs should be implemented ASAP, not later than October, with detail research program review in August or September 1973.

Background

The APHIS screwworm Eradication Program in the southwest was not effective in 1972. The program in Arizona is currently in a critical situation. The number of cases that have occurred through June in Arizona exceeds by far the number that occurred by this time in 1972 or in previous years since the program was fully implemented in 1963. Field data from Mexico during the spring of 1973 indicated that massive over-flooding of wild fly population with sterile flies failed to reduce fertility of egg masses below 50%. Preliminary isoenzyme analyses of APHIS mass production stock have indicated a great loss of genetic variability (heterozygosity). Genetic deterioration of laboratory and plant production stocks has affected the quality of released flies as measured by mating competitiveness under field conditions but not the quanity (current plant production exceeds 200 million flies per week).

Source of Interest

The failure of the eradication program in 1972-73 is a matter of concern and alarm to the entire livestock industry. This is of high interest to U.S. Senators and Representatives from the Southwestern States and the joint U.S.-Mexico Screwworm Eradication Commission.

Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

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Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

Anticipated Consequences

~~Transfer from APHIS to~~ ARS assume the responsibility ~~and funds (5-10% of screwworm eradication budget)~~ for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the joint U.S.-Mexico eradication program and expand attractant field studies in USA and Mexico.

Contacts for Additional Information

E. F. Knipling	Beltsville, MD	PH. (301) 344-3245
W. Klassen	Beltsville, MD	PH. (301) 344-3918
L. S. Henderson	Beltsville, MD	PH. (301) 344-3924
R. C. Bushland	Mission, TX	PH. (512) 585-2783
E. A. Taylor	Weslaco, TX	PH. (512) 968-5913

Date Submitted June 29, 1973

Priority Category I Definite
Category II Immediate
Category III ARS

Expanded APHIS Eradication Program budget $16-19 million. ARS Current program $752,000 (see proposed new budget.)

Anticipated Consequences

Transfer from APHIS to ARS the responsibility and funds (5-10% of screwworm eradication budget) for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the joint U.S.-Mexico eradication program.

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Anticipated Timing

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Source of Interest

The failure of the eradication program in 1972-73 is a matter of concern and alarm to the entire livestock industry. This is of high interest to U. S. Senators and Representatives from the Southwestern States and the Joint U.S.-Mexico Screwworm Eradication Commission.

Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

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United States Department of Agriculture
Agricultural Research Service

Description of Event

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Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

Anticipated Consequences

ARS assume the responsibility for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the Joint U.S.-Mexico Eradication Program and expand attractant field studies in the United States and Mexico. Expanded APHIS Eradication Program budget $16 - $19 million; ARS current program $252,000. (See proposed new budget.)

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E. A. Taylor	Weslaco, TX	PH. (512) 968-5913

Date Submitted July 16, 1973

Priority	Category	I	Definite
	Category	II	Immediate
	Category	III	ARS

Anticipated Consequences

ARS assume the responsibility for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the Joint U.S.-Mexico Eradication Program and expand attractant field studies in the United States and Mexico. Expanded APHIS Eradication Program budget $16 - $19 million; ARS current program $252,000. (See proposed new budget.)

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Date Submitted July 16, 1973

Priority Category I Definite
Category II Immediate
Category III ARS

PROPOSAL FOR EXPANDED ARS APPLICATION

SCREWWORM RESEARCH PROGRAM

ARS production of breeding stocks to be supplied daily to APHIS:

1. Have 3 genetically distinct breeding stocks each developed from 20 or more field collected egg masses.

2. To maintain genetic purity of strains each (designated A, B, and C) reared separately as shown on building sketch.

3. For breeding stocks to produce 200 million flies weekly, APHIS now eggs 3 million. We will give APHIS 1 million eggs per day--333,000 each of strains A, B, and C. APHIS will rear these eggs to adult and stock rearing cages with equal mixture of A, B, and C pupae--10,000 - 12,000 of each strain. At random mating eggs from these cages will be 1/9 pure A, 1/9 pure B, 1/9 pure C and 2/3 will be AB, AC or BC with hybrid vigor.

4. To produce ARS eggs we will start stocks each day for strain A (similarly for B and C):

15,000 pupae in standard colony cage
Egg when 8 days old;
7,000 females should survive, if only half oviposit;
3500 @ 200 eggs each lay 700,000 eggs. (Quota is 333,000)

If this margin of safety is inadequate we can increase cage stocks to as high as 35,000 flies.

5. Production facilities should easily be adequate to produce 2 million flies of each strain per week extra capacity for field tests.

6. A fourth rearing area equivalent to those for the 3 production strains will be used to develop new colonies and to test new procedures. There will be built up reserve strains to be field tested as candidate replacements for production strains. It is anticipated that each production strain will be replaced by a newer strain within 2 years to maintain breeding stocks as nearly wild-type as possible.

7. Isozyme studies will be used to monitor each generation of production stocks. Isozyme surveys will be indexes of genetic variability of field collections.

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If this margin of safety is inadequate we can increase cage stocks to as high as 35,000 flies.

5. Production facilities should easily be adequate to produce 2 million flies of each strain per week extra capacity for field tests.

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New Building and Equipment for Screwworm Breeding Colonies:

New 80 x 80 building for breeding stocks:
(Estimates by Joe Smithey for APHIS force construction)

Building shell	$ 50,000
Electrical, air-conditioning, plumbing	$ 25,000
Total	$ 75,000

Equipment:

Colony cages (APHIS specs.)	36 @ $530 ea.	$ 19,080
Rearing vats (APHIS spec.)	21 @ $130 ea.	$ 2,730
Vat racks (APHIS spec.)	7 @ $150 ea.	$ 1,050
Bacteriological incubators	4 @ $300 ea.	$ 1,200
Rearing vats (1/4 size)	12 @ $ 75 ea.	$ 900
Pupa holding trays	48 @ $ 10 ea.	$ 480
Larva capture pans	56 @ $10 ea.	$ 560
Media mixers	4 @ $300 ea.	$ 1,200
Refrigerators	4 @ $250 ea.	$ 1,000
Total		$ 28,200

Equipment for physiology research:

Bioclimatic cabinets	2 @ $1700 ea.	$ 3,400

Miscellaneous rearing equipment:

Small cages	100 @ $10 ea.	$ 1,000
Larva sifters	4 @ $75 ea.	$ 300
Larva-pupa separators	4 @ $100 ea.	$ 400
Total		$ 1,700

GRAND TOTAL $108,300

New Building and Equipment for Screwworm Breeding Colonies:

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GRAND TOTAL		$108,800

New Positions for Expanded Application Research for Screwworm:

2	Entomologists GS-12 (Mexico, field)	$ 34,000
1	Entomologist GS-12 (Physiology)	$ 17,000
1	Entomologist GS-12 (Laboratory Rearing)	$ 17,000
1	Biochemist GS-12 (Isozyme studies)	$ 17,000
1	Technician GS-7 (Laboratory rearing)	$ 9,500
3	Technicians GS-5 (Laboratory rearing)	$ 23,400
3	Technicians GS-3 (Laboratory rearing)	$ 18,500
3	Technicians GS-1 (Fly sorting)	$ 15,000
1	Laborer WB-2 (Laboratory Janitor)	$ 5,000
1	Clerk GS-3 (Office)	$ 6,200
17	Total	$162,600
	Travel and Support	$113,400
	Total	$275,000
	Rearing building and equipment (APHIS contribution)	$108,300
	GRAND TOTAL	$383,300

APHIS should supply food for larvae and adults and utilities for new building.

Date Submitted: July 16, 1973

New Positions for Expanded Application Research for Screwworm:

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Date Submitted: July 16, 1973

Mr Douglas
copy
1 cy to C. Hess
B. Morgan
7.21

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United States Department of Agriculture
Agricultural Research Service

Description of Event

Field data indicate sterile screwworm flies released in eradication program have low mating competitiveness and are essentially ineffective in eradicating screwworms or at least maintaining fly populations below economic levels.

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Source of Interest

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Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

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ARS assume the responsibility for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the Joint U.S.-Mexico Eradication Program and expand attractant field studies in the United States and Mexico. Expanded APHIS Eradication Program budget $16 - $19 million; ARS current program $252,000. (See proposed new budget.)

Contacts for Additional Information

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Date Submitted July 16, 1973

Priority	Category	I	Definite
	Category	II	Immediate
	Category	III	ARS

Anticipated Consequences

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PROPOSAL FOR EXPANDED ARS APPLICATION

SCREWWORM RESEARCH PROGRAM

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If this margin of safety is inadequate we can increase cage stocks to as high as 35,000 flies.

5. Production facilities should easily be adequate to produce 2 million flies of each strain per week extra capacity for field tests.

6. A fourth rearing area equivalent to those for the 3 production strains will be used to develop new colonies and to test new procedures. There will be built up reserve strains to be field tested as candidate replacements for production strains. It is anticipated that each production strain will be replaced by a newer strain within 2 years to maintain breeding stocks as nearly wild-type as possible.

7. Isozyme studies will be used to monitor each generation of production stocks. Isozyme surveys will be indexes of genetic variability of field collections.

PROPOSAL FOR EXPANDED ARS APPLICATION

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Total	$ 75,000

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Rearing vats (APHIS spec.)	21 @ $130 ea.	$ 2,730
Vat racks (APHIS spec.)	7 @ $150 ea.	$ 1,050
Bacteriological incubators	4 @ $300 ea.	$ 1,200
Rearing vats (1/4 size)	12 @ $ 75 ea.	$ 900
Pupa holding trays	48 @ $ 10 ea.	$ 480
Larva capture pans	56 @ $10 ea.	$ 560
Media mixers	4 @ $300 ea.	$ 1,200
Refrigerators	4 @ $250 ea.	$ 1,000
Total		$ 28,200

Equipment for physiology research:

Bioclimatic cabinets	2 @ $1700 ea.	$ 3,400

Miscellaneous rearing equipment:

Small cages	100 @ $10 ea.	$ 1,000
Larva sifters	4 @ $75 ea.	$ 300
Larva-pupa separators	4 @ $100 ea.	$ 400
Total		$ 1,700

GRAND TOTAL $108,300

New Building and Equipment for Screwworm Breeding Colonies:

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1	Biochemist GS-12 (Isozyme studies)	$ 17,000
1	Technician GS-7 (Laboratory rearing)	$ 9,500
3	Technicians GS-5 (Laboratory rearing)	$ 23,400
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1	Clerk GS-3 (Office)	$ 6,200
17	Total	$162,600
	Travel and Support	$113,400
	Total	$275,000
	Rearing building and equipment (APHIS contribution)	$108,300
	GRAND TOTAL	$383,300

APHIS should supply food for larvae and adults and utilities for new building.

Date Submitted: July 16, 1973

New Positions for Expanded Application Research for Screwworm:

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Date submitted: July 16, 1973

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United States Department of Agriculture
Agricultural Research Service

Description of Event

Field data indicate sterile screwworm flies released in eradication program have low mating competitiveness and are essentially ineffective in eradicating screwworms or at least maintaining fly populations below economic levels.

Anticipated Timing

New application research programs should be implemented ASAP, not later than October, with detail research program review in August or September 1973.

Background

The APHIS screwworm eradication program in the Southwest was not effective in 1972. The program in Arizona is currently in a critical situation. The number of cases that have occurred through June in Arizona exceeds by far the number that occurred by this time in 1972.or in previous years since the program was fully implemented in 1963. Field data from Mexico during the spring of 1973 indicated that massive over-flooding of wild fly population with sterile flies failed to reduce fertility of egg masses below 50%. Preliminary isoenzyme analyses of APHIS mass production stock have indicated a great loss of genetic variability (heterozygosity). Genetic deterioration of laboratory and plant production stocks has affected the quality of released flies as measured by mating competitiveness under field conditions but not the quantity (current plant production exceeds 200 million flies per week).

Source of Interest

The failure of the eradication program in 1972-73 is a matter of concern and alarm to the entire livestock industry. This is of high interest to U. S. Senators and Representatives from the Southwestern States and the Joint U.S.-Mexico Screwworm Eradication Commission.

Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide sexually aggressive flies for plant production and fully support the expanded eradication program in Mexico.

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Proposed Action

Complete review of current research findings and evaluation of a proposed screwworm application research program that will provide seasonally aggressive flies for plant production and fully support the expanded eradication program in Mexico.

Anticipated Consequences

ARS assume the responsibility for the maintenance and production of at least three separate fly strains (brood flies) which would provide eggs for APHIS plant production of release flies. Expand ARS application research program in order that adequate ecological and fly population information will be available in Mexico to support the Joint U.S.-Mexico Eradication Program and expend attractant field studies in the United States and Mexico. Expanded APHIS Eradication Program budget $16 - $19 million; ARS current program $252,000. (See proposed new budget.)

Contacts for Additional Information

E. F. Knipling	Beltsville, MD	PH. (301) 344-3245
W. Klassen	Beltsville, MD	PH. (301) 344-3918
L. S. Henderson	Beltsville, MD	PH. (301) 344-3924
R. C. Bushland	Mission, TX	PH. (512) 585-2783
E. A. Taylor	Weslaco, TX	PH. (512) 968-5913

Date Submitted July 16, 1973

Priority	Category	I	Definite
	Category	II	Immediate
	Category	III	ARS

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Date Submitted July 16, 1973

Priority Category I Definite
Category II Immediate
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PROPOSAL FOR EXPANDED ARS APPLICATION

SCREWWORM RESEARCH PROGRAM

ARS production of breeding stocks to be supplied daily to APHIS:

1. Have 3 genetically distinct breeding stocks each developed from 20 or more field collected egg masses.

2. To maintain genetic purity of strains each (designated A, B, and C) reared separately as shown on building sketch.

3. For breeding stocks to produce 200 million flies weekly, APHIS now eggs 3 million. We will give APHIS 1 million eggs per day--333,000 each of strains A, B, and C. APHIS will rear these eggs to adult and stock rearing cages with equal mixture of A, B, and C pupae--10,000 - 12,000 of each strain. At random mating eggs from these cages will be 1/9 pure A, 1/9 pure B, 1/9 pure C and 2/3 will be AB, AC or BC with hybrid vigor.

4. To produce ARS eggs we will start stocks each day for strain A (similarly for B and C):

15,000 pupae in standard colony cage
Egg when 8 days old;
7,000 females should survive, if only half oviposit;
3500 @ 200 eggs each lay 700,000 eggs. (Quota is 333,000)

If this margin of safety is inadequate we can increase cage stocks to as high as 35,000 flies.

5. Production facilities should easily be adequate to produce 2 million flies of each strain per week extra capacity for field tests.

6. A fourth rearing area equivalent to those for the 3 production strains will be used to develop new colonies and to test new procedures. There will be built up reserve strains to be field tested as candidate replacements for production strains. It is anticipated that each production strain will be replaced by a newer strain within 2 years to maintain breeding stocks as nearly wild-type as possible.

7. Isozyme studies will be used to monitor each generation of production stocks. Isozyme surveys will be indexes of genetic variability of field collections.

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New Building and Equipment for Screwworm Breeding Colonies:

New 80 x 80 building for breeding stocks:
(Estimates by Joe Smithey for APHIS force construction)

Building shell		$ 50,000
Electrical, air-conditioning, plumbing		$ 25,000
Total		$ 75,000

Equipment:

Colony cages (APHIS specs.)	36 @ $530 ea.	$ 19,080
Rearing vats (APHIS spec.)	21 @ $130 ea.	$ 2,730
Vat racks (APHIS spec.)	7 @ $150 ea.	$ 1,050
Bacteriological incubators	4 @ $300 ea.	$ 1,200
Rearing vats (1/4 size)	12 @ $ 75 ea.	$ 900
Pupa holding trays	48 @ $ 10 ea.	$ 480
Larva capture pans	56 @ $10 ea.	$ 560
Media mixers	4 @ $300 ea.	$ 1,200
Refrigerators	4 @ $250 ea.	$ 1,000
Total		$ 28,200

Equipment for physiology research:

Bioclimatic cabinets	2 @ $1700 ea.	$ 3,400

Miscellaneous rearing equipment:

Small cages	100 @ $10 ea.	$ 1,000
Larva sifters	4 @ $75 ea.	$ 300
Larva-pupa separators	4 @ $100 ea.	$ 400
Total		$ 1,700

GRAND TOTAL $108,000

New Building and Equipment for Screwworm Breeding Colonies:

New 60 x 80 building for breeding stocks:
(Estimates by Joe Smithey for APHIS force construction)

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Date Submitted: July 16, 1973

File: Screwworm Budget Info.

EOT

Screwworm Research Laboratory
P. O. Box 986
Mission, Texas 78572

July 27, 1973

Subject: Budget for FY 74

To: H. C. Cox
Associate Deputy Administrator
USDA, ARS, Southern Region
New Orleans, Louisiana 70153

In response to your request over the telephone on July 25, I am attaching a longhand draft defending our request for a budget increase.

This is to supplement the material Mr. Taylor sent you via telecopier on July 16.

I hope that I have followed your instructions well enough for you to combine the new material with Mr. Taylor's proposal.

R. C. Bushland
Research Leader

cc: E. A. Taylor

Enclosure

Screwworm Research Laboratory
P. O. Box 988
Mission, Texas 78572

July 27, 1973

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USDA, ARS, Southern Region
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Research Leader

cc: E. A. Taylor

Enclosure

Budget for FY 1974

In FY 1963 the Mission screwworm research laboratory was established with a budget of $200,000. For FY 1974 the tentative budget is 256,500. This budget has not only failed to keep up with inflation, but it has not kept pace with the APHIS screwworm eradication program that ARS is obligated to support. The APHIS screwworm eradication program started in 1963 with an annual budget of 5 million. In FY 1973 the budget was 9 million and, with the Mexico operation included, the FY 1974 budget is approximately 16 million. ARS responsibilities and fiscal needs to support the program have increased in the same proportion.

The increased needs for our research are outlined below:

1. <u>Mexico has added new problems.</u>

In November, 1974 a new rearing plant is scheduled for completion at Tuxtla Gutierrez in the Isthmus of Tehuantepec. This plant is to produce 300 million sterile flies weekly to compete for mates against the wild population of southern Mexico. There is zero research knowledge

regarding specifics on genetics, ecology, mating behavior, population biology, etc. for this area. We have done no research south of the state of Vera Cruz and neither has anyone else. We have very little knowledge of screwworms along the whole Pacific Coast of Mexico.

2. The eradication effort is in difficulty. Last year there were 96,625 cases of screwworm identified in Texas on the basis of samples mailed to Mission program staff. In addition there were many more unreported cases. This year, aided by a cold winter, the situation is not so acute in Texas but Arizona is experiencing the worst screwworm year since the program started. ARS has restored some of the research capability of its Mission staff which had dwindled by attrition since 1964 but the small increases were inadequate to find the answers to the problems related to screwworm reinvasion of the U.S. The merger budget of $256,500 cannot cope with the added problems in Mexico.

Field tests made jointly with APHIS near Tampico and Victoria, Mexico in the spring of 1973 showed that only

50% of the wild females mated with sterile males; some through trapping studies showed that sterile flies outnumbered wild flies more than 300 to 1. The continued increase of screwworm cases in Texas since the end of winter suggests that the released flies are not fully competitive. We do not know why, and we need more scientists to seek answers.

3. <u>Need for genetic research.</u>

The literature of insect genetics has many references showing that insects lose field adaptability through natural selection as they become adapted to laboratory colonization and mass rearing. It may be that a loss of competitiveness among sterile flies is due to genetic deterioration in the laboratory. The new technique of isozyme analysis makes available biochemical markers to trace genetic changes in laboratory populations. We need to add to our staff a biochemist to study biochemical variability in new field collections, and to test each generation in the laboratory to ensure that those field

characteristics are maintained.

4. Need for ecological research

We need many field samples of screwworms from southern Mexico and the Pacific Coast for genetic comparison. It is essential that the flies to be sterilized and released in these new areas of Mexico, match the heredity of the populations in which they compete for mates. To collect these field samples of new insect strains representing varied ecological situations, we need 2 bilingual insect ecologists - one for northern and one for southern Mexico. In addition to field collecting the ecologists would field test strains of sterilized flies for mating competitiveness in all the varied environments of Mexico. The ecologists would also investigate any peculiarities of screwworm biology in these new, previously unstudied environments.

5. Need for physiological research.

The GS-15 entomologist doing laboratory and field studies on screwworm attractants retired in May 1973. The attractants research is far from complete. We do

not kept have a bait better than decomposing liver which is not good enough for APHIS to use to keep track of fly populations. Liver does not attract male screwworms and it is not specific for females, but attracts many more ordinary blowflies. This makes it impractical to monitor eradication progress with fly traps. For efficiency in our research effort we need a more selective bait and to follow male fly activity we need a male attractant.

We have only one insect physiologist on the staff and he is fully occupied with rearing problems and doing various physiological tests such as flight studies, mating competitiveness, longevity, energy reserves, and other varied laboratory investigations needed to evaluate the effects of benefits, rearing procedures, dispersal techniques, etc. on fly vigor. These studies must be monitored full time so another physiologist is required for attractants research.

6. Laboratory studies on genetics have multiple benefits.

The APHIS program would directly and immediately benefit from the genetics studies because the production plant would get all of its breeding flies as pedigreed eggs each day.

Entomologists all over the world have had the success with screwworms as an example to stimulate research on the sterile male technique for the control of other insects. No other similar application program has succeeded over a large geographic area, so until there is similar success with other insects, it is essential that we solve the screwworm problems. Otherwise, eradication efforts on other insects in the U.S. and abroad will look a model of success.

Academic university scientists interested, not in practical pest control, but intellectually curious about evolution, speciation, genetics of behavior, etc., have followed our work with interest. Some have expressed special excitement about genetic changes in laboratory populations. Our work on domestication

and maintaining genetic fitness of laboratory strains will enhance the reputation of ARS in academic circles. Further, success will guide other insect ecologists working with other forms of biological control such as parasites and predators.

7. The screwworm problem won't just fade away.

If our intense research effort presently underway, combined with dedicated work on the part of APHIS and a redoubled effort (they have for the past year released 200 million flies per week while 100 million per week sufficed to eradicate screwworms from the U.S. and prevent from reinvasion during 1963 to 1966) should bring about temporary relief the problem is still there and getting bigger. We should get ready for all the new problems sure to come in Mexico with the expanded program. After that successes will have to hold the line and perhaps continue to advance eradication into Central America.

Screwworm Mating by Sound.

1 day - ♂ ♀ responded

2 days later ♂ " made attempts on ♂ for 20 min.

10 Aphis

$\frac{8''_r}{10}$

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Tuesday, Aug. 29, 1972—13
VALLEY MORNING STAR
HARLINGEN, TEXAS

U.S., Mexico In Screwworm Pact

MEXICO CITY (UPI)—U. S. Agriculture Secretary Earl Butz flew to Mexico Monday to sign an agreement with the Mexican government for a joint five-yea $40 million campaign against the feared cattle disease caused by the screwworm fly.

Butz has an appointment with Mexican President Luis Echeverria at the Los Pinos Presidential Palace.

The signing ceremony was set in the office of Mexican Foreign Relations Secretary Emilio Rabasa where Butz's Mexican colleague, Bernardo Aguirre, and Sen. John G. Tower, R - Tex., were also scheduled to be present.

Aguirre hosted a dinner for Butz Monday night and the Agriculture Secretary flies back to Washington on Tuesday.

Basic agreement for the joint campaign, to be financed mostly with U.S. funds, was reached during the June meeting of Echeverria with President Nixon in Washington.

Despite the dropping of millions of sterilized flies over the Mexico-U. S. border area, the southwestern United States is experiencing one of the worst outbreaks of the cattle disease ever so far this year, making the new effort necessary.

In remarks prepared for his airport arrival, Butz called for the same successful endeavors in international cooperation as those which resulted in the eradication of the hoof-and-mouth disease 20 years ago.

"The task will not be easy," Butz said, but he added that he was confident that "our people and yours, side-by-side on the job" will be able to eradicate the screwworm disease now causing millions of dollars worth of losses to cattle breeders in both countries every year.

The program eventually foresees the erection of a barrier across the Tehuantepec Isthmus in southeastern Mexico to prevent the screwworm flies from entering the northern Mexico cattle ranches from Central and South America.

VALLEY MORNING STAR
HARLINGEN, TEXAS
Thursday, Aug. 31, 1972—A9

Kika Hails Screwworm Treaty

WASHINGTON (UPI) — Rep. Kika de la Garza, D-Tex., applauded a United States-Mexico cooperative agreement Wednesday as a serious attempt at ending the screwworm epidemic in the Lower Rio Grande Valley and northern Mexico.

The South Texas Congressman said the agreement is the culmination of an effort begun by Texas cattlemen through the Southwest Animal Health Research Commission in 1962. De la Garza said then Vice President Lyndon B. Johnson was responsible for funding the first screwworm erradication center at Mission, Tex.

The agreement, announced Tuesday by Agriculture Secretary Earl Butz, establishes a joint commission between the two countries with $40 million dollars committed to establishing a screwworm barrier at the Isthmus of Tehauntepec in Mexico.

De la Garza cited other problems facing the Lower Rio Grande Valley, such as the black citrus fly infestation and uncontrolled tributaries of the Rio Grande which have produced costly flooding in recent years.

He said a far reaching program aimed at wiping out the citrus fly could be instituted along the lines of the screwworm program. The uncontrolled pest could damage millions of citrus trees on which the valley dependent, he said.

"It is mandatory that there be a joint commission established to study these flood plains to forestall possibly disastrous flooding on both sides of the border," de la Garza said.

Flooding from Hurricane Beulah in 1967 and Hurricane Celia in 1970 amounted to hundreds of millions of dollars in damages.

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Proposal for Screwworm Research Under Contingency Funds, FY 1973

1. Problem: The ARS needs to expand screwworm research to assist APHIS in a critical eradication problem. The eradication program encountered severe problems in controlling screwworms in Texas in the summer and fall of 1971 and screwworm control failed in Texas and Oklahoma in 1972. The ARS Mission laboratory could not provide answers to questions as to whether wild flies had developed a form of genetic resistence to the sterile male technique or whether there was no change in the wild flies, but rather a deterioration in the field competitiveness of sterilized flies. To obtain such answers requires greatly expanded field research in Texas and a renewal of intensified research in Mexico. The only way in which critical field studies can be restored is through an expansion of the budget to return to the capabilities of the laboratory as it was originally organized in FY 1962 at an annual budget of $200,000.

2. Plan of Work: Redirect emphasis from long term basic records and routine support studies to problem oriented emergency research. This has already been started by the June 1972 transfer of a GS-11 Laboratory Entomologist, Joyce DeVaney, to College Station, Texas and replacing her with a GS-13 Field Entomologist, Calvin Jones, transferred from Lincoln, Nebraska. In August 1972 Dr. R. C. Bushland, GS-16 Research Entomologist, who did the original experiments on screwworm sterilization was returned to leadership of screwworm research by transfer back from Fargo, N. D. O. H. Graham, GS-15 Research Entomologist at Kerrville has been detailed for up to 6 months TDY at Mission to reemphasize field research in Mexico. D. E. Hopkins, GS-11 Agricultural Research Technician, and Charles Dawkins, GS-9 Biological Aid, have been detailed from Kerrville for up to 6 months TDY at Mission. Their prime duty is to assist in emergency field experiments and to train 3 new temporary appointees in the technician skills needed for intensified field research.

Proposal for Screwworm Research Under Contingency
Funds, FY 1973

1. Problem: The ARS needs to expand screwworm research to assist APHIS in a critical eradication problem. The eradication program encountered severe problems in controlling screwworms in Texas in the summer and fall of 1971 and screwworm control failed in Texas and Oklahoma in 1972. The ARS Mission Laboratory could not provide answers to questions as to whether wild flies had developed a form of genetic resistance to the sterile male technique or whether there was no change in the wild flies, but rather a deterioration in the field competitiveness of sterilized flies. To obtain such answers requires greatly expanded field research in Texas and a renewal of intensified research in Mexico. The only way in which critical field studies can be restored is through an expansion of the budget to return to the capabilities of the laboratory as it was originally organized in FY 1962 at an annual budget of $200,000.

2. Plan of Work: Redirect emphasis from long term basic records and routine support studies to problem oriented emergency research. This has already been started by the June 1972 transfer of a GS-11 Laboratory Entomologist, Joyce DeVaney, to College Station, Texas and replacing her with a GS-13 Field Entomologist, Calvin Jones, transferred from Lincoln, Nebraska. In August 1972 Dr. R. C. Bushland, GS-16 Research Entomologist, who did the original experiments on screwworm sterilization was returned to leadership of screwworm research by transfer back from Fargo, N. D. O. H. Graham, GS-15 Research Entomologist at Kerrville has been detailed for up to 6 months TDY at Mission to reemphasize field research in Mexico. D. E. Hopkins, GS-11 Agricultural Research Technician, and Charles Dawkins, GS-9 Biological Aid, have been detailed from Kerrville for up to 6 months TDY at Mission. Their prime duty is to assist in emergency field experiments and to train 3 new temporary appointees in the technician skills needed for intensified field research.

3. Action Taken or Anticipated: The transfer of Dr. Bushland, the detailing of Dr. Graham, Mr. Hopkins, and Mr. Dawkins have already been done in anticipation of increased funding. Expanded field work is now underway and employment of 3 new temporary helpers (at WB 4 or 5, or GS-3 or 4 levels) is being requested. There will be a minimum requirement of $82,900 contingency funds in addition to the regular appropriation. A proposed budget follows:

Contingency Budget

Personal services:	
a. 3 technicians, GS-3 or 4	$ 16,000
b. Laborers (in Mexico)	2,500
Fringe benefits	1,400
Travel - Domestic:	
a. Regular (Per diem for TDY)	10,000
b. Meetings	-
Travel - Foreign:	
a. Regular	10,000
b. Meetings	-
Supplies	
Chemicals, traps, and field cages	8,000
Animal feed	5,000
Animal pens	2,000
Gas, oil, vehicles maintenance	5,000
Equipment:	
a. Purchase 6 vehicles	18,000
b. Lease	-
Construction and Repair:	5,000
Total	$82,900

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4. Type of Work:

   a. Emergency research to discover the course of current eradication problems.

   b. Develop new and more vigorous strains of screwworm flies to cope with the present situation.

   c. Conduct monitoring studies on the field performance of whatever kind of sterile fly that APHIS releases.

   d. Conduct ecological studies in southern and western Mexico in preparation for the joint US-Mexico program scheduled to be activated in FY 1974.

   e. Conduct genetic studies in flies from all over Mexico so that proper stocks will be available to APHIS for the expanded program.

5. Estimated duration: The estimated duration of this research program is 3 - 5 years.

6. Financing After 1973: Budget increase of 3 SMY required to support $40 million expanded eradication program in Mexico.

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NEED FOR ADDITIONAL FUNDS FOR SCREWWORM
RESEARCH IN FY 1974

1. Work Reporting Unit: 401-7204-11990 Screwworm Biology and Control

2. Location: Screwworm Research Laboratory
Subtropical Texas Area
ARS-USDA
P. O. Box 986
Mission, Texas 78572

The Annual WRU Report and Plan for 1974 provides for a budget of only $252,000 although the 1973 funding was $345,300.

5. Specific Objectives for FY 1974: These objectives represent the minimum ARS support for screwworm eradication.

6. Plan of Work for FY 1974:

Item 6 of the Annual WRU Report and Plan for 1974 outlines how these objectives can be attained. It is obvious that such a plan cannot be followed with funding of only $252,000.

The ARS research program is in direct support of the Southwestern Screwworm Eradication Program conducted by APHIS with a budget of $8,900,000 for FY 1974. In addition, a joint-US-Mexico Screwworm Eradication Commission (funded 80% by the US) is budgeted for $8,000,000 for FY 1974 to construct a plant and begin operations in the Isthmus of Tehuantepec.

ARS invented the sterile male technique and developed most of the procedures which APHIS uses in the screwworm eradication program. APHIS relies exclusively on ARS to conduct the basic research on screwworm genetics, screwworm ecology and insect physiology to insure that the eradication program has vigorous stocks of genetically fit flies. ARS works cooperatively with APHIS in jointly monitoring the effectiveness of the program. The $252,000 budget is woefully inadequate for such cooperation.

The $345,300 available in 1973 is insufficient for 1974. We are committed to collect screwworms from the Isthmus of Tehuantepec and other areas of Mexico previously unstudied. We must colonize each collection, test its biology in the laboratory, and do ecological and genetic studies in order to provide the joint US-Mexico Screwworm Commission with a competitive strain for sterilization and field release by April 1974. This represents an added research task that must be funded with an additional $50,000 for a total of $395,300 for FY 1974.

Further, we must continue similar studies in Northern Mexico to provide a specialized strain to continue the present Southwestern Eradication Program. If we get $345,300 we can do that half of the job. If we have to operate on the budget of $252,000, it will be barely adequate for salaries and laboratory operations and will not finance field work essential to insure properly bred flies for APHIS operations.

Proposal for Screwworm Research Under Contingency Funds, FY 1973

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5. Estimated duration: The estimated duration of this research program is 3 - 5 years.

6. Financing After 1973: Budget increase of 3 SMY required to support $40 million expanded eradication program in Mexico.

SUBTROPICAL TEXAS AREA
P. O. Box 267
Weslaco, Texas 78596

June 4, 1974

1 acre

Subject: Construction of a 1/2-Acre Field Cage for Research with Fertile Screwworm Flies

To: A. W. Cooper, Deputy Administrator
Southern Region, ARS USDA
New Orleans, LA

Enclosed is an ARS Construction Proposal for a 1/2-acre field cage for research with fertile screwworm flies. This facility would greatly reduce the cost of field evaluation that is urgently needed to determine the effects of diets or rearing and handling procedures on actual fly performance of various new strains. You may recall the discussion at the Executive Conference regarding the very high cost of field evaluation tests. These tests involve 4-5 thousand square miles with 4-5 million flies per week over a period of several months.

The current tests in Mexico to evaluate the newly developed strains will probably cost about $200,000 in scientific effort, direct support, supplies, and travel. Logistic support is difficult, but the most serious scientific fault is lack of replication.

We believe a large field cage using fertile flies to assimilate the wild population will provide the means for obtaining replication of treatments and may allow simultaneous field evaluations of several factors and may serve as the basis for discovering mating sites and behavior, host finding, and other critical observations that have not been observed in nature.

This cage was proposed as a necessary research tool several years ago, but APHIS protested vigorously and ARS did not press the issue. We have learned that APHIS will now allow the operation of such a facility with fertile flies at Weslaco, provided that security is adequate. We are certain that this can be achieved. This facility will be encompassed with a six-foot woven wire fence, a double-screen for the cage, and a laboratory headhouse for showers and added security. Space is available on leased property at the Weslaco Research Center.

SUBTROPICAL TEXAS ARNA
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Weslaco, Texas 78596

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We urge that this construction proposal be given high priority and consideration for FY 1975.

Edgar A Taylor

E, A. Taylor
Area Director

Enclosure

cc w/encl:
L.S.Henderson
J. W. Snow

ARS:SR:EATaylor:je 6/4/74

Sent via telecopier to A.W.Cooper and L.Henderson on 6/5/74.

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ARS:SR:EATaylor:je 6/4/74

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ARS Construction Proposal, Fiscal Year 1975

Southern Region

May 13, 1974

Program Code: 02-604 CONSTRUCTION OF A FIELD CAGE FOR RESEARCH WITH FERTILE SCREWWORM ADULTS

Facility: Screwworm Research Cage, Weslaco, Texas

Location: Subtropical Texas Area, Mission, Texas

Amount: Approximately $296,000 Construction

Research activities to be conducted in whole or in part at the proposed facility include:

a. Conduct tests to determine if assortive mating is occurring in the field. The determination of this phenomenon, if it exists, can be established and solutions found only through the use of a cage or similar device.

b. Evaluate competitiveness of laboratory production flies against wild fly populations. In addition, comparisons involving the effects of radiation, cold, heat, etc., on competitiveness will be evaluated.

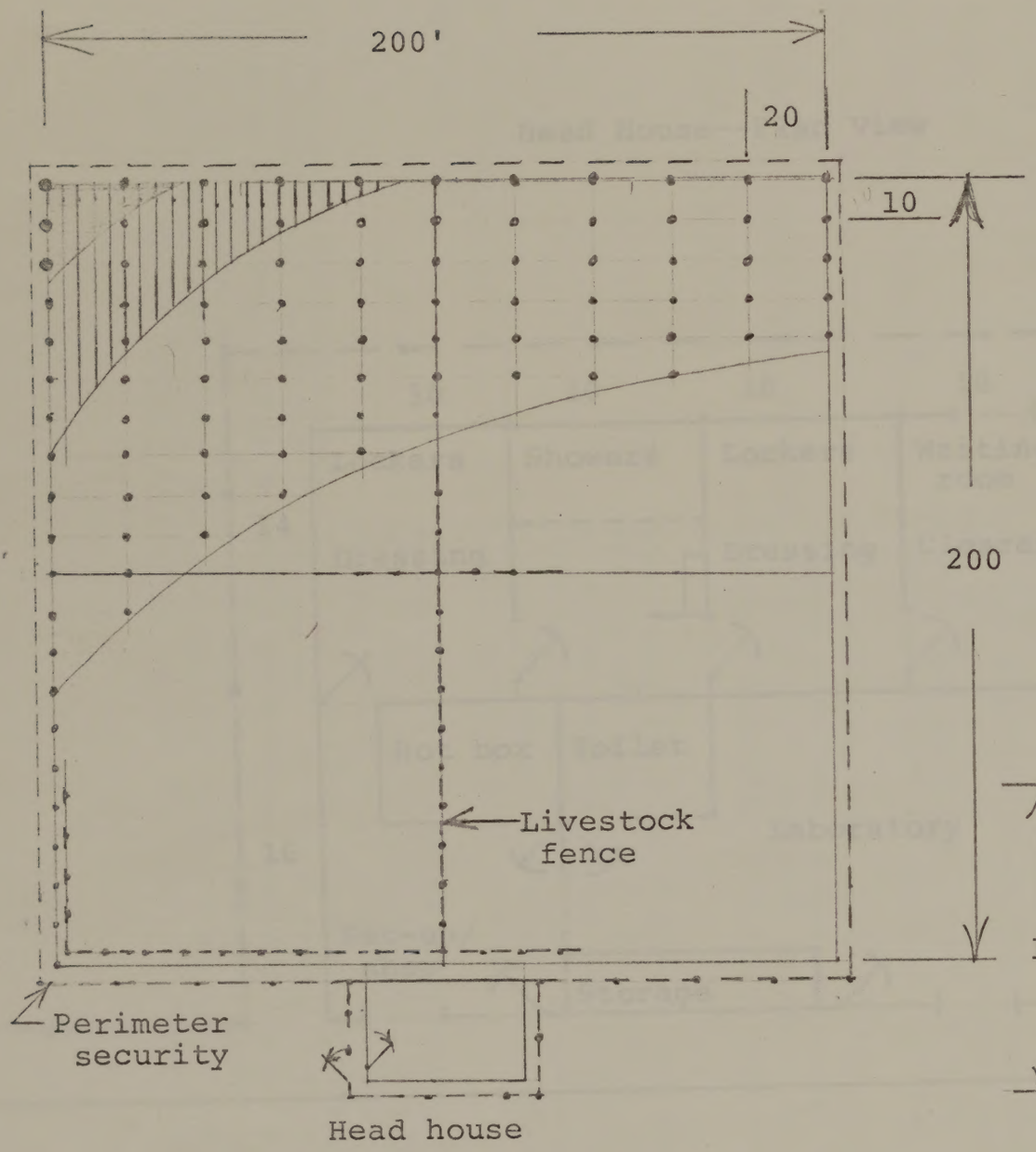
c. Conduct biological studies of the life cycle, circadian rhythms, host relationship, winter survival, etc.

d. Develop and test traps designed to capture adults based on sex, sound, or host.

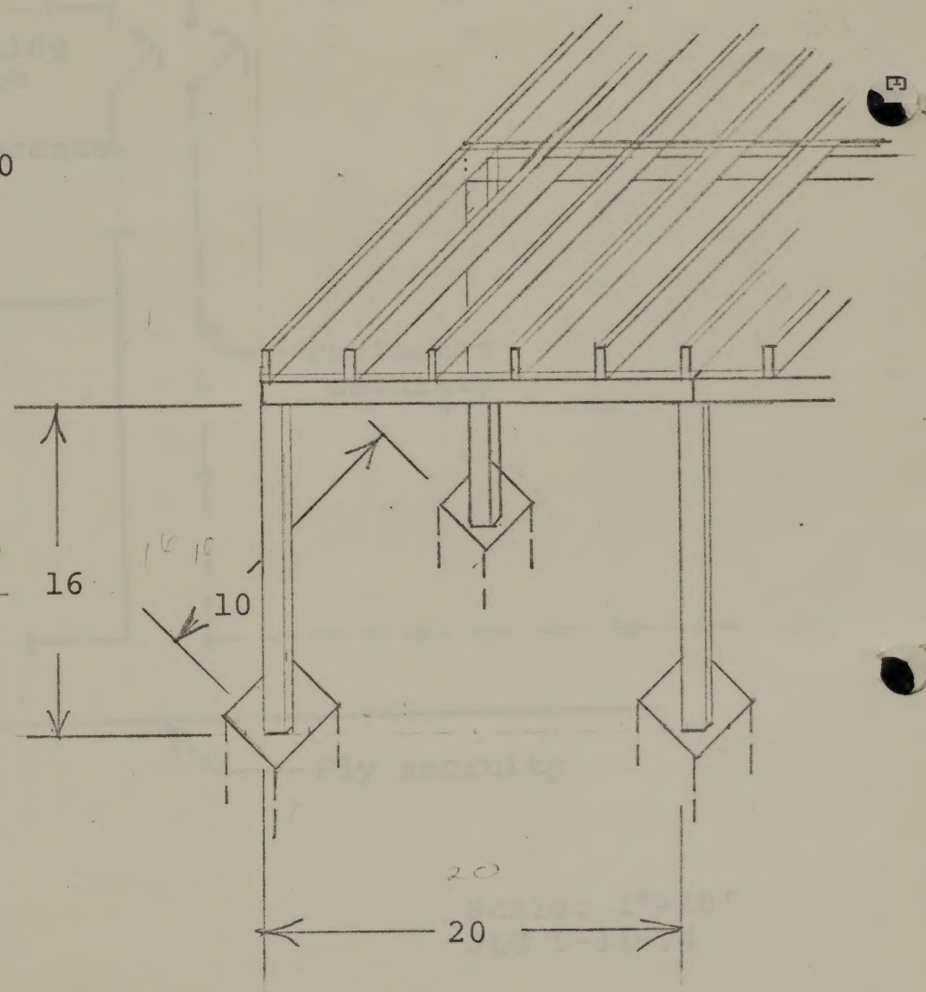
Need for Construction: Field tests to evaluate new strains or determine the effects of various procedures on fly performance are difficult and inaccurate. Usually many square miles, millions of adults, airplanes, pilots and large ground truth teams are involved. A cage of sufficient size to permit normal fly activity will eliminate most field tests and greatly improve the overall research effort. Observations of screwworm behavior in nature are rare because of their sparse distribution. Cage observations will serve as the basis to obtain clues on mating sites, behavior, host finding, etc. The much talked about possibility of assortive mating can be established and defined only through the use of cages or similar methods.

Plan of Work: The facilities are to be constructed at Weslaco, Texas, to escape the odors and high factory release population at Moore Air Base. Weslaco provides protected federal property, year round availability, easy access and security control from Mission. In addition, the structure can be used for other research purposes once the screwworm needs are completed. The cage is probably the most needed research tool to insure adequate data in support of the screwworm eradication program.

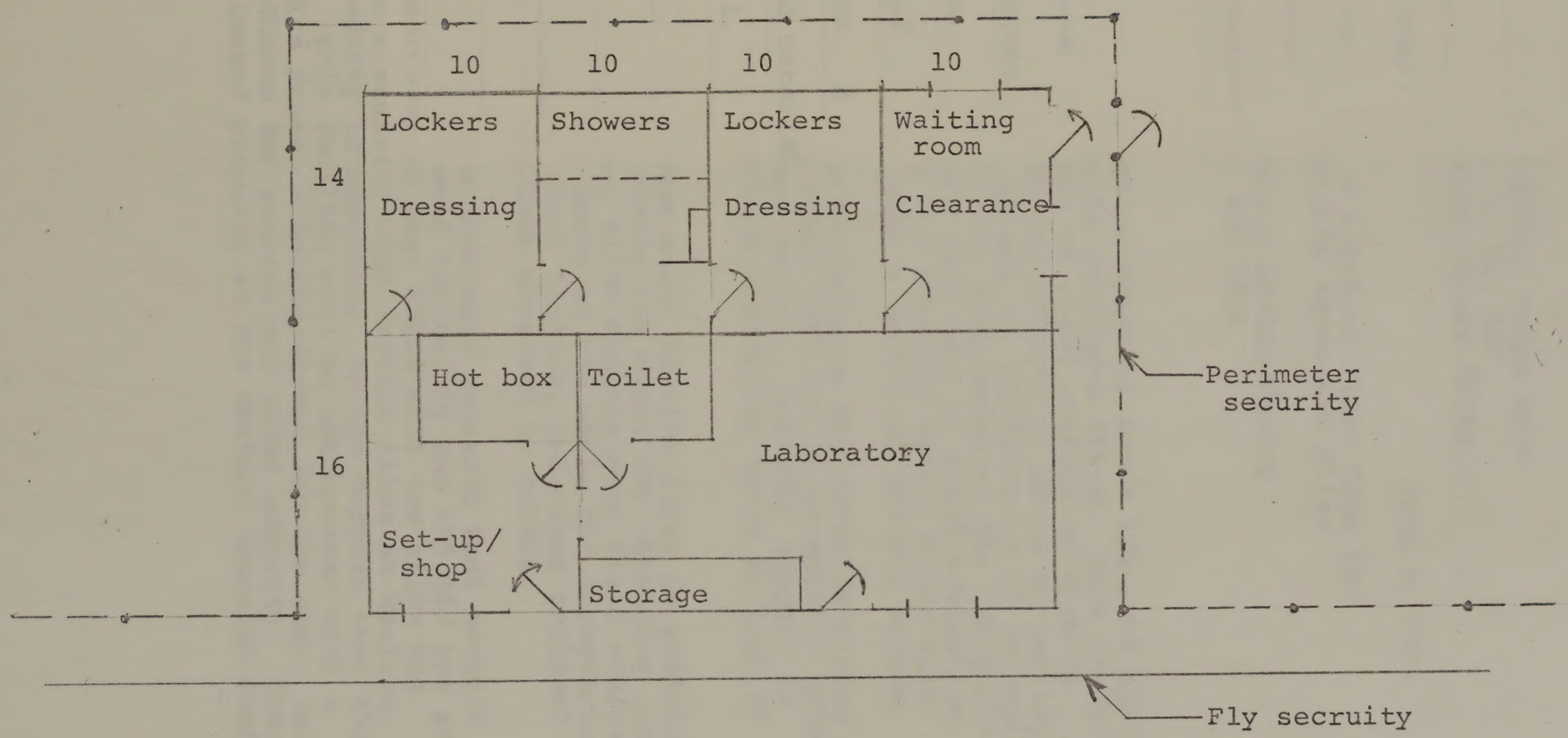
Fly Cage--Plan View



Cage support detail



Head House--Plan View



Scale: 1"=10'
JLG 5-11-74

Sent via telecopier 6/5/74. JE

U.S. DEPARTMENT OF AGRICULTURE

REFERENCE SLIP

DATE 6/5/74

TO

Lyman S. Henderson, NPS

(Transmittal: 5 pages)

- [ ] ACTION
- [ ] APPROVAL
- [ ] AS REQUESTED
- [ ] FOR COMMENT
- [x] FOR INFORMATION
- [ ] INITIALS
- [ ] NOTE AND FILE
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- [ ] PER PHONE CALL
- [ ] RECOMMENDATION
- [ ] REPLY FOR SIGNATURE OF
- [ ] RETURNED
- [ ] SEE ME
- [ ] YOUR SIGNATURE

REMARKS You may wish to discuss this with Dr. McCracken. Please furnish a copy of attached to Don Williams. A carbon copy of attached material will follow in the mail.

FROM E. A. Taylor, AD
Weslaco, TX

GPO : 1964 OF—742-059 FORM AD-514 (8-64)

Sent via telecopier 6/5/74. JE

U.S. DEPARTMENT OF AGRICULTURE | DATE

REFERENCE SLIP | 6/5/74

TO

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SUBTROPICAL TEXAS AREA
P. O. Box 267
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June 4, 1974

Subject: Construction of a 1/2-Acre Field Cage for Research with Fertile Screwworm Flies

To: A. W. Cooper, Deputy Administrator
Southern Region, ARS USDA
New Orleans, LA

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Edgar A Taylor

E, A. Taylor
Area Director

Enclosure

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E. A. Taylor
Area Director

Enclosure

Request for Approval of A Significant Shift

1. Initiation of Request:

C. L. Hoffpauir
Assistant to Deputy Administrator
Southern Region

2. Description of Shift:

The proposed shift involves the transfer of H. E. Brown, Chemist, from Food Crops Utilization Research, Weslaco to the Screwworm Research Unit at Mission, Texas. Also proposed is the temporary transfer of his salary until the projected FY '75 increase is allocated to Mission, Texas.

3. Justification:

One of the recommendations of the Executive Review of the Screwworm Research Program, January 22-23, 1974, was to initiate experimentation regarding the nutritional requirements and utilization of protein by screwworm larvae under factory conditions. Because of the urgency of this research, H. E. Brown was temporarily assigned for duty at Mission. In a short time he has made a significant contribution to the overall screwworm project. In order to ensure success of promising initial experimentation, it is highly desirable to locate H. E. Brown at Mission in a permanent position.

Brown's work at Weslaco will be continued by E. Stein, GS-9, Chemist.

Funds Transferred: 1/

From 7202-15600 -$26,200

To 7204-11990 + 26,200

1/ Temporary basis until FY '75 increase is allocated

4. Action:

	Signature		Date
Recommended:	C. L. Hoffpauir	Action:	Aug 9, 1974
Concurred:		PACS:	
Concurred:		NPS:	
Concurred:		BFD:	
Approved:		Director, PACS:	

U.S. DEPARTMENT OF AGRICULTURE

REFERENCE SLIP

DATE 8-8-75

TO

E. A. Taylor, AD
Welcome Report

- [ ] ACTION
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REMARKS

H.C. Cox

FROM

GPO 648-16-83471 1

FORM AD-514 (8-64)

AGRICULTURAL RESEARCH SERVICE
701 LOYOLA AVENUE
P.O. BOX 53326
NEW ORLEANS, LOUISIANA 70153

UNITED STATES DEPARTMENT OF AGRICULTURE

SOUTHERN REGION
OFFICE OF DEPUTY ADMINISTRATOR

August 8, 1975

Subject: Field Cage for Screwworm Studies

To: J. M. Hejl, Deputy Administrator
Veterinary Services, APHIS

We are enclosing a copy of a construction proposal made by our Mission laboratory last year. This proposal is a bit different from most that we receive. Not only do funds have to be available, but APHIS will have to give approval before such a facility can be used. Funds for construction were not available last year; therefore, we did not contact you regarding the matter.

We still have no assurance of funding but the prospects for FY76 are more favorable than in the past. We understand that Dr. J. Wendell Snow, Director of our Screwworm Research Laboratory, has discussed the proposed cage with Dr. S. C. Gartman and Dr. Donald Miller from time to time. Presumably you would require more detailed information regarding construction and operation than we have enclosed with this letter; however, we will appreciate receiving your reaction regarding the operation of a field cage for research on fertile screwworm flies. If the proposal seems feasible, we will be pleased to provide more specific protocol regarding proposed use, as well as any details on construction that you would require.

H C Cox
Associate Deputy Administrator

Enclosure

cc:
T. B. Kinney, Jr.
H. O. Graumann
E. A. Taylor
J. W. Snow
L. M. Short

ARS Construction Proposal, Fiscal Year 1975

Southern Region

May 13, 1974

Program Code: 02-604 CONSTRUCTION OF A FIELD CAGE FOR RESEARCH WITH FERTILE SCREWWORM ADULTS

Facility: Screwworm Research Cage, Weslaco, Texas

Location: Subtropical Texas Area, Mission, Texas

Amount: Approximately $296,000 Construction

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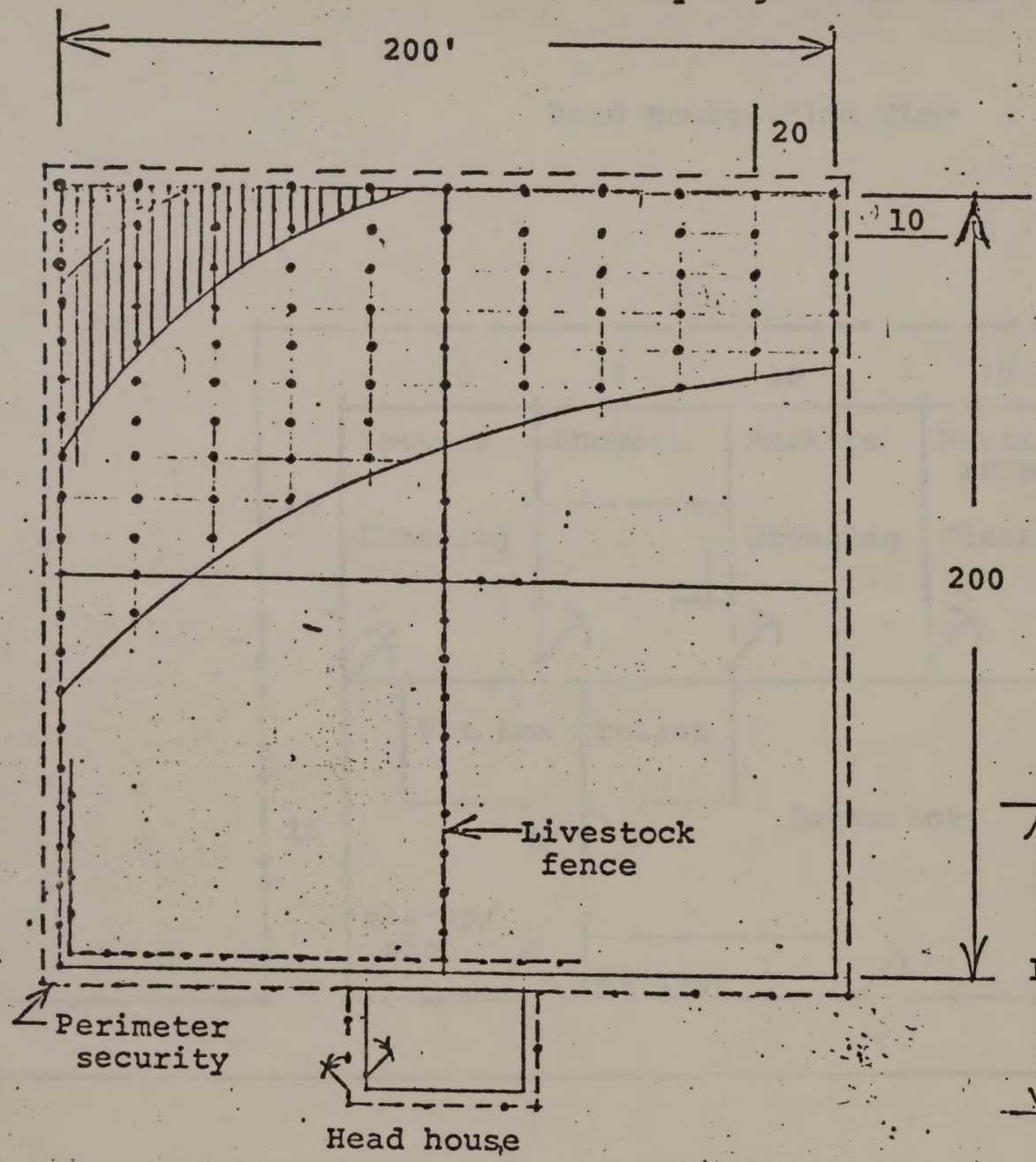
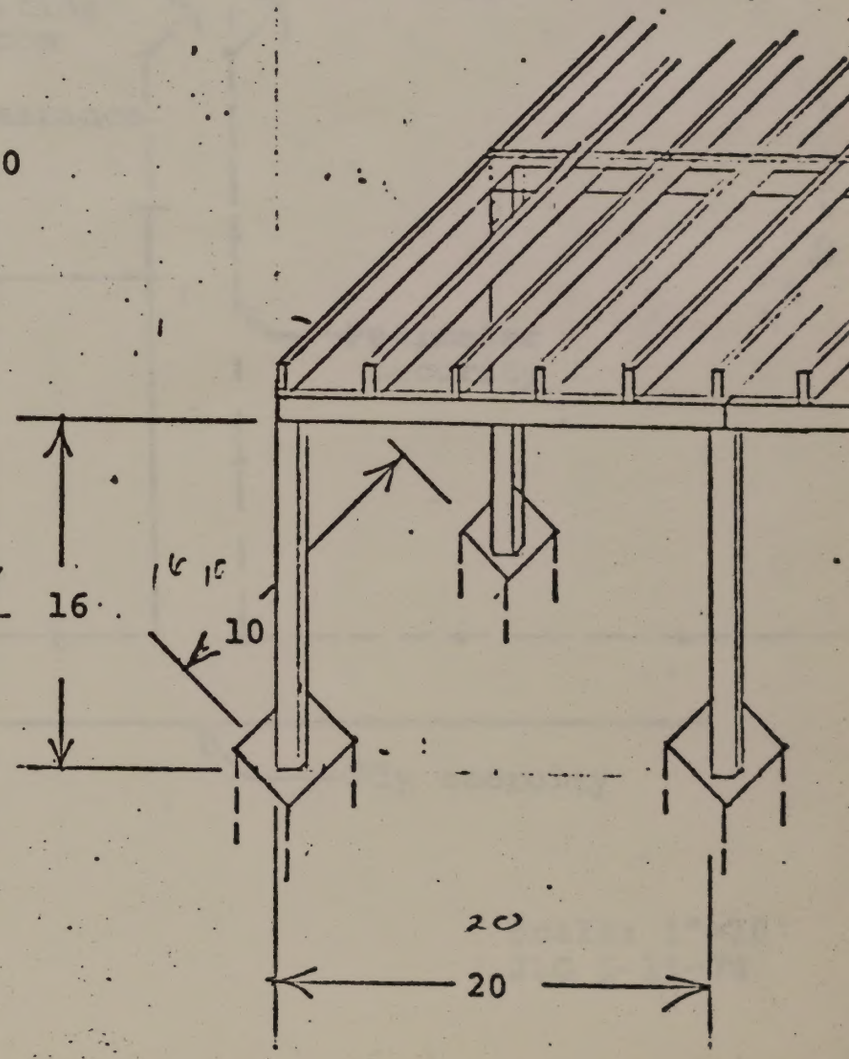
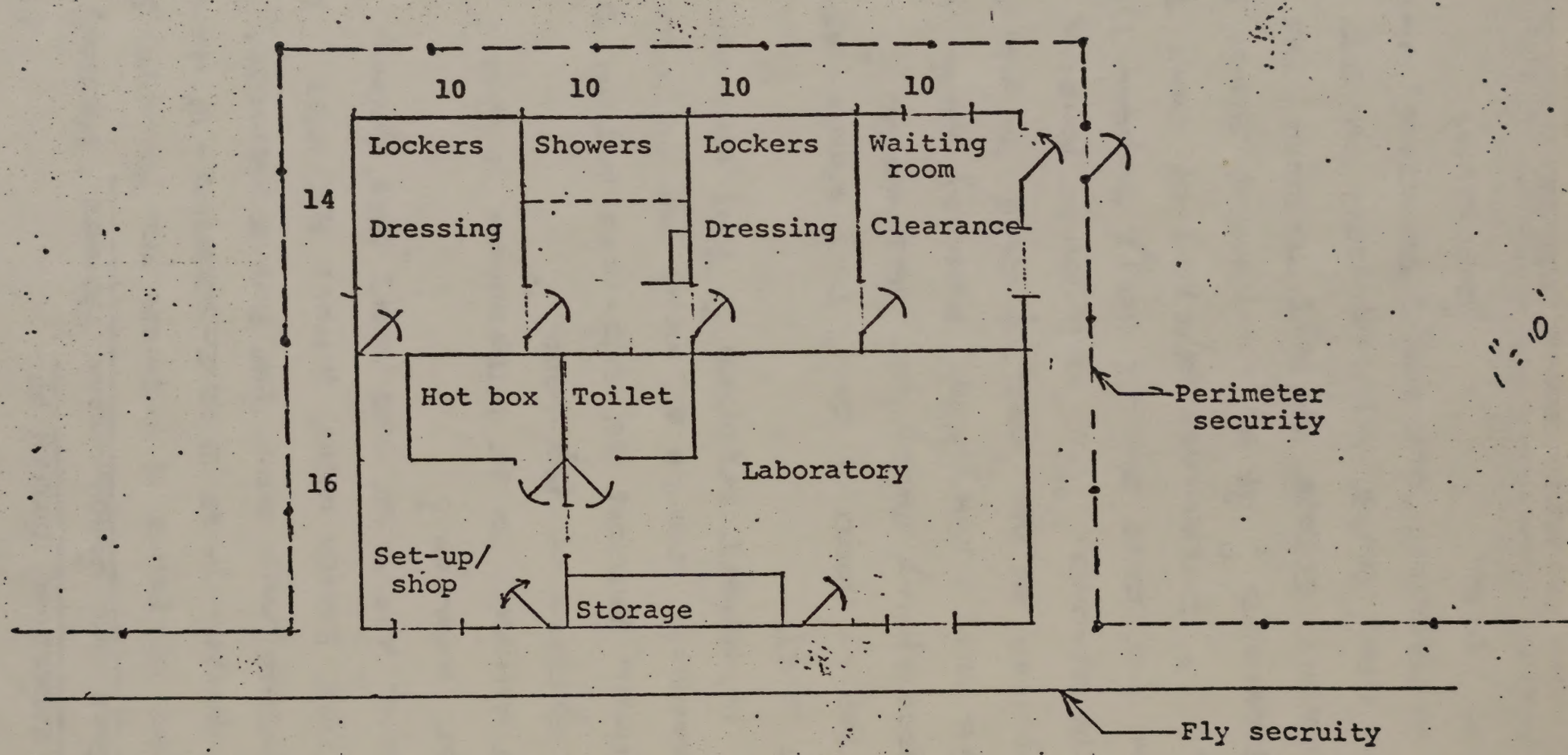


Cage support detail



Head House--Plan View



Scale: 1"=10'
JLG 5-11-74

Rec'd Via Tele 8/13/75 11:15 am

To: Dr. Wm. F. Schwiesow, Weslaco, Texas
From: Leonard M. Short, Architect, SPAO, New Orleans, La.

Questions Regarding Design of 8-12-75
Field Cage for Screwworm Studies - Mission, Texas

1. What type of fence is required for perimeter security?
2. Is cage proper to be double-screened - 16' high screening both outside and inside the frame members?
3. What type screen wire should be used? What mesh?
4. If "livestock" are to be used what size animals will be involved?
5. How are animals to be introduced to cage? Thru some system of fly-lock?
6. Will animal shelters be required within the cage?
7. What provisions should be made for watering?
8. Why is 16' height required? This will add greatly to the cost.
9. Do we really need a cage this large - approx 1 acre - to successfully carry out this work?
10. We think that a continuous masonry chain wall will be required on all sides of cage to assure a tight seal to ground. This will cause ponding of water within the cage during heavy tropical type rains. Should a drainage system of some type be provided? If so what means should be used to prevent escape of flys through the drains?
11. We will need more information on site including data on required clearing, elevations, drainage ditches, etc.

(continued)

LD CAGE - SCHOOLMAN STUDIES - CONT'D 8-12-75

WHAT TYPE CONSTRUCTION IS SUITABLE FOR HEAD-HOUSE?

HOW MANY PEOPLE WILL BE REQUIRED FOR OPERATIONS?

- IE: LOCKER & SHOWER REQUIREMENTS ARE DIRECTLY RELATED TO STAFF SIZE.

IS HEAD-HOUSE TO BE AIR-CONDITIONED?

WHAT EQUIPMENT GOES INTO LABORATORY?

WHAT PLUMBING & ELECTRICAL ARE REQUIRED FOR LAB?

IS WATER AVAILABLE AT SITE?

IS SITE ADJACENT TO A SUITABLE SANITARY SEWER LINE OR WILL A SEPTIC TANK AND BLEEDER FIELD BE REQUIRED?

IS NATURAL GAS AVAILABLE AT SITE?

IS ELECTRICAL POWER AVAILABLE AT SITE?

IF SO, WHAT ARE CHARACTERISTICS?

TE: DR COX HAS REQUESTED VERIFICATION OF THE ESTIMATED $296,000 CONSTRUCTION COST FOR THIS CAGE AND RELATED ITEMS. IN ORDER THAT WE CAN PRODUCE ANY SORT OF ESTIMATE WE MUST HAVE DETAILED INFORMATION.

ROUTING AND TRANSMITTAL SLIP

			ACTION
1 TO (Name, office symbol or location) Dr. Schwiesow	INITIALS		CIRCULATE
	DATE		COORDINATION
2	INITIALS		FILE
	DATE		INFORMATION
3	INITIALS		NOTE AND RETURN
	DATE		PER CONVERSATION X
4	INITIALS		SEE ME
	DATE		SIGNATURE

REMARKS

9,046.00	Balance on 20480 account
- 2,000.00	Estimated cost on transfer (Dr. Spencer)
- 4,000.00	Estimated cost on transfer (Dr. Whitten)
- 499.00	P.O. #40-7D65-7-370 (Repair)
- 178.00	P.O. #40-7D65-7-371 (Repair)
- 500.00	Imptest Fund
- 1,716.00	Minus on 02010 account
153.00	Remaining Balance on FY-77 funds.

Do NOT use this form as a RECORD of approvals, concurrences, disapprovals, clearances, and similar actions.

FROM (Name, office symbol or location)	DATE
Mike	9-13-77
	PHONE

DATE: SEP

701-7204- 20480
REPORT

Uncommitted Balance on A-5 102,029

Unreported: Committed, Ordered, and..... 20,688
ARS-80 10,000

Remaining Balance of FY-77 Funds 71,341

- -

Total Budget for FY-77 678,900

Remaining Balance of FY-77 Funds 71,341

Expenditures for 607,559

- -

Remaining Balance of FY-77 71,341

Salary Money Required to Support Remaining FY-77

PP: .....

" 76 ....19.....13,843.53 X 4.... 55,374

" thru 20 = 6,921 X 1 = + 6,921

Total:....62,295.... 62,295

Remaining Balance: 2,000 - 3,100 and 3,000
Money: 9,046

DATE: SEP

701-7204- 02010
REPORT

Uncommitted Balance on A-5 6,496

Unreported: Committed, Ordered, and..... 116
ARS-80 2,000

Remaining Balance of FY-77 Funds 4,380

- -

Total Budget for FY-77 85,603

Remaining Balance of FY-77 Funds 4,380

Expenditures for 81,223

- -

Remaining Balance of FY-77 4,380

Salary Money Required to Support Remaining FY-77
PP: .....
" 76 ....19 = 1,354.89 X 4..... 5,419
" ____ thru 20 = 677.45 X 1 = + 677
Total:....6,096 6,096

Remaining Balance: 2,000 - 3,100 and 3,000
Money: ..... -1,716